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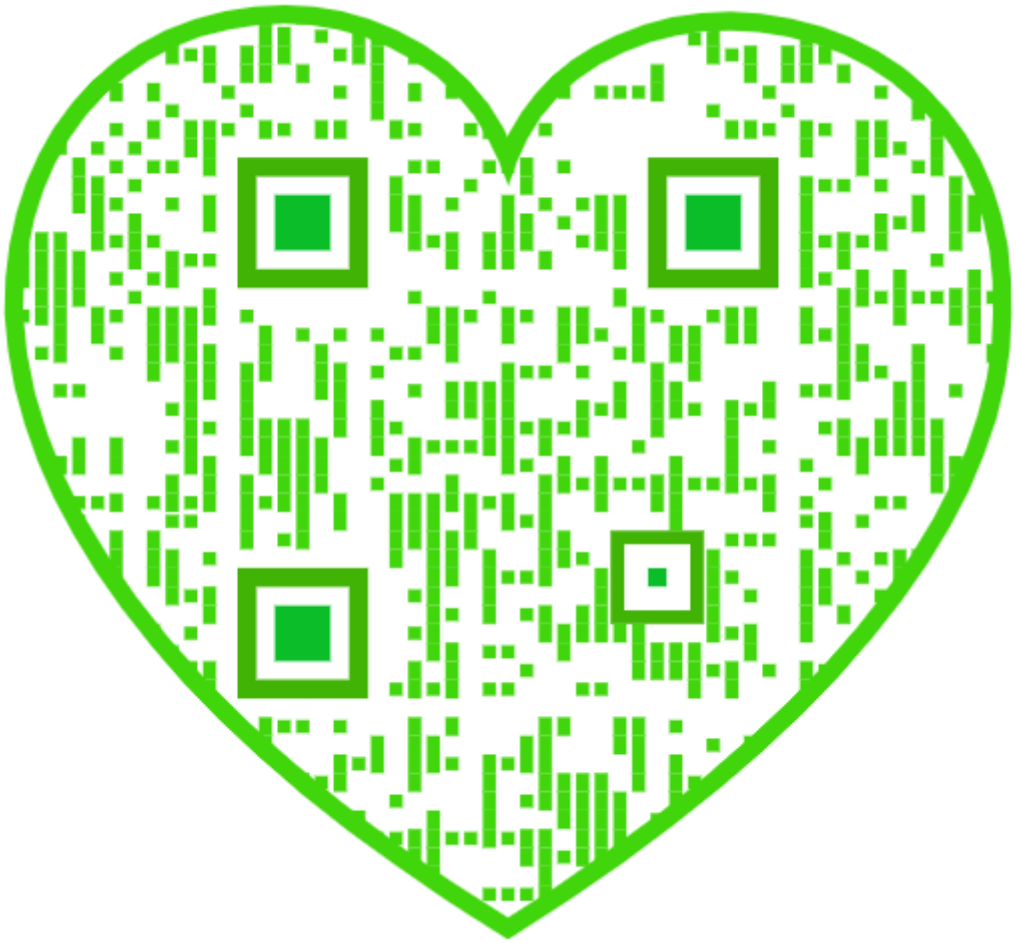

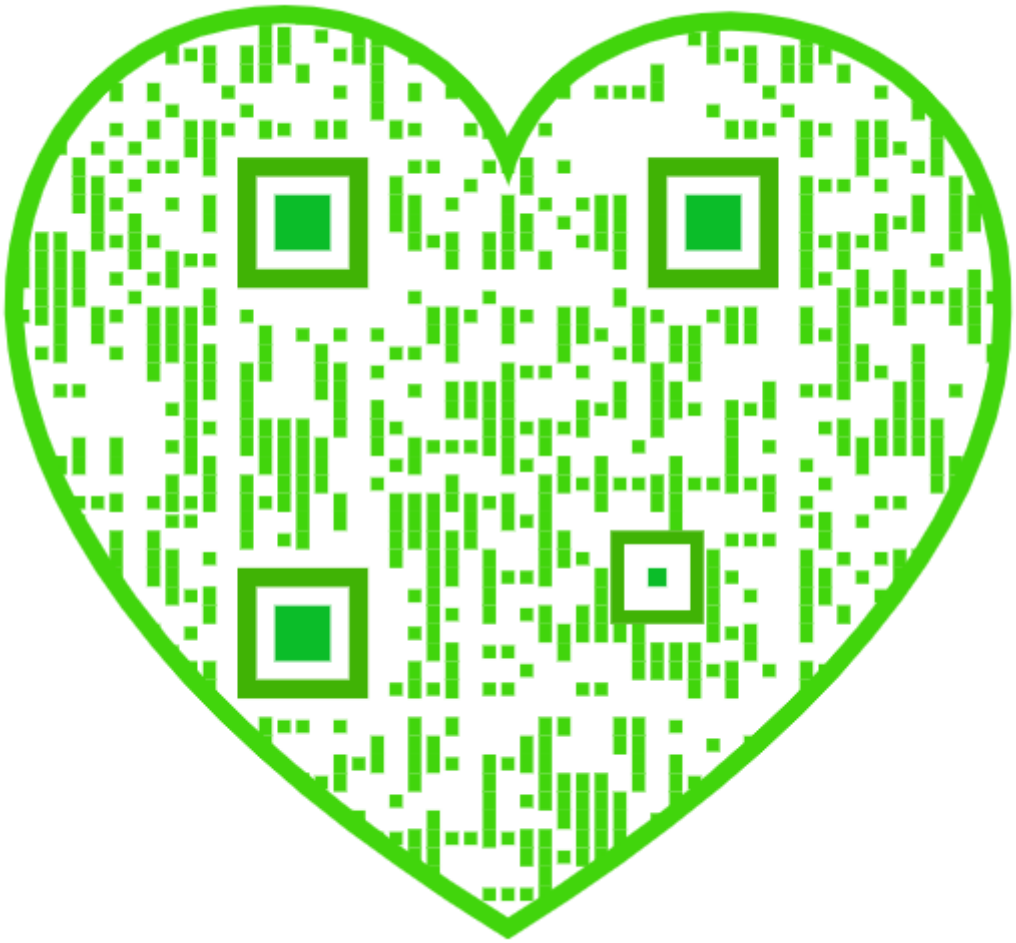

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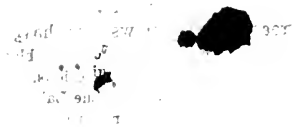

SAXTON'S HAND-BOOK

ON

TOBACCO CULTURE,

BEING A COMPLETE

MANUAL OR PRACTICAL GUIDE

FOR THE

SELECTION OF THE SOIL AND ITS PREPARATION; KIND AND QUANTITY OF MANURES TO BE USED, AND HOW APPLIED; GROWTH OF PLANTS; TRANSPLANTING AND MODE OF CULTURE GENERALLY, FROM TIME OF PLANTING THE SEED BED, THROUGH HARVESTING, CURING, AND PREPARATION FOR MARKET.

With Illustrations,

SHOWING THE PLANT IN ITS DIFFERENT STAGES OF GROWTH.

NEW YORK:
C. M. SAXTON,
AGRICULTURAL BOOK PUBLISHER.
1863.

AGRICULTURE
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PREFACE.

THE census report of 1860 represents that 429,390,771 pounds of tobacco were grown in the United States in that year, worth, at the low price of 10 cents per pound, $43,000,000, and entering very largely into our foreign commerce. Till within a few years, its culture has been confined to a narrow zone, under a stereotyped impression that, south of that zone, the cultivation was unprofitable, and north of it forbidden by climatic influences. The discovery, now fully confirmed, that it can be grown as well north as anywhere else, has led many farmers, yet inexperienced in the cultivation, to demand some plain, instructive, practical directions on the cultivation adapted to beginners and all others. Hence this manual; and hence our endeavors to make it a complete guide to cultivators of less or more experience, from the beginner upwards, and to adapt it to a wide range of climate, by drawing from the well-considered views of practical men over a wide range of country. Such as the result of our labor is, it is here respectfully inscribed to the farmers of this great and, *agriculturally considered*, most prosperous country,

By their friend and humble servant,

C. M. SAXTON.

New York, ~~March, 1869.~~

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TOBACCO.

NAME—VARIETIES—HISTORY—COMMERCIAL VALUE.

Tobacco *(nicotiana tabacum)* probably received its generic name, *Nicotiana,* from John Nicot, of Nismes, in Languedoc. Nicot was sent ambassador from the King of France to Portugal; he there obtained the seeds from a Dutchman, who had brought them from Florida. Nicot is said to have presented the first plant to Catharine de Medicis. From this circumstance the former French name, *herbe a la reine* (Queen's plant) is supposed to have been derived.

Its specific name, Tobacco, which has now displaced all others, is believed, by some, to have been derived from Tobago, a West India Island. Others, and among them the lexicographer, Webster, trace it to Tabaco, a province in Yucatan, where it is said (probably without truth) that the Spaniards first discovered it. According to Las Casas, the Spaniards, in their first voyage, saw many of the natives smoking dry leaves, rolled up in tubes, called *tabacos.* Charlevoix, the historian of San Domingo, relates, that the instrument used by the natives in smoking, was called tabaco. The name tobacco, pretty evidently, comes, therefore, either from

the island *Tobago*, or from the province *Tabaco*, or from the Indian smoking-pipe ; quite as likely from the latter.

Tobacco is evidently a plant of American nativity, first used by the aborigines, introduced into Europe something over two hundred years ago, and now of very general use in all quarters of the globe.

SPECIES.

Louden, in his *Encyclopœdia of Plants*, enumerates no less than fourteen species of the genus Nicotiana. Of these, Eaton's *North American Botany* mentions the following four, the first three of which are marked as exotic, the last as southern :

Nicotiana... { Tabacum (Virginia). Rustica (common). Paniculata (small flowered). Quadrivalvis (four leaved).

The above, with ten others, enumerated by Louden, are regarded by botanists as distinct species. The *lobelia*, found so much in pastures, often causing slavering in horses, though erroneously called *wild tobacco*, is a distinct genus, having no relation to the *nicotiana*, or tobacco plant. Of the varieties, suited to different purposes and varying latitudes, we may speak in another place.

HISTORY.

Tobacco was taken to England in 1586, by Ralph Lane. It was used only for smoking. Sir Walter Raleigh was the first to acquire the practice, having learned it from Lane. Its use in this way spread

rapidly, and may be said to have been quite general throughout Europe for at least two centuries. It is cultivated in Europe as far north as Sweden, also in China, Japan, and many other eastern countries. In England, it has been cultivated successfully, though, we presume, not profitably, as the dampness of the climate must greatly increase both the labor and the uncertainties ; and its cultivation is now prohibited. It is nowhere seen growing in that country, except occasionally a few plants in gardens, rather as a curiosity than for use. The sort more generally preferred is the Virginia species. The common, or *nicotiana rustica* is, however, preferred in some of the northern countries of Europe, on account of its being somewhat earlier. Sir Walter Raleigh is said to have preferred this, and said he could make the best article from it.

TAXATION OF TOBACCO.

Tobacco appears to have been subject to excessive taxation in most European countries. One might almost ask, if the people of Europe did not love tobacco, where would the sovereigns get their money? In France the revenue on tobacco has been $10,000,000 a year and upwards. The people of England have paid as high as eight hundred per cent. on tobacco, and on some qualities more than a thousand. At a meeting of tobacco planters in 1840, it was shown authentically, that on an exportation of 100,000 hogsheads, valued here at $7,000,000, the consumers in Europe paid in imposts more than $30,000,000. Whatever may be the future course of our Government, with regard to the encouragement of home industry, Europeans, and especially Englishmen, can hardly have a face to complain.

COMMENCEMENT AND PROGRESS OF CULTIVATION.

"In 1611, tobacco was first cultivated in Virginia by the use of the spade, previous to which it had only been raised after the rude manner of the Indians. In 1616, it was cultivated in that colony to so alarming an extent, that even the streets of Jamestown were planted with it, and various regulations were framed to restrain its production. In 1617, the prices varied from 37½ to 75 cents per pound. In 1621, each person was required to cultivate one thousand plants, of eight leaves, weighing in the aggregate 100 pounds. In 1622, there were made in the colony 60,000 pounds. In 1639, it was enacted by the Grand Assembly, 'that all the tobacco planted this present year, and the two succeeding years, in the colony of Virginia, be absolutely destroyed and burned, excepting and reserving so much, in equal proportion to each planter, as shall make, in the whole, just the quantity of 120,000 pounds, stripped, smoothed, &c. In consideration whereof, the creditors of the planters were compelled to accept and receive 40 pounds of tobacco, so stripped and smoothed, in full satisfaction of every 100 pounds now due them.' This plant, when its half-inebriating and soothing influence recommended it to popular use, encountered much violent opposition by several governments, which also attempted to restrain its consumption by penal edicts. The Sultan Amurath IV. forbade its importation into Turkey, and condemned to death those found guilty of smoking. The Grand Duke of Moscow prohibited its entrance into his dominions under pain of the 'knout' for the first offense, and death for the next; and in other parts of Russia the practice of smoking was denounced, and all smokers condemned to have their noses cut off. The Shah of Persia, and other eastern sovereigns, were equally severe in their enactments. Pope Urban VIII. anathematized all those who smoked in churches. Upwards of a hundred volumes were written to condemn its use, the names of which have been preserved and their titles cat-

alogued; and among them, not the least singular was the 'Counterblaste' of the pedantic King James I. Tobacco was cultivated in New Netherland as early as 1646, when it sold for 40 cents per pound. It was introduced into Louisiana by the 'Company of the West,' in 1718. Some time previous to the war of Independence, the culture of tobacco had spread into Maryland, Carolina, Georgia, and Louisiana, from which nearly all Europe was supplied; but, at present, most of the sovereigns of the Old World derive a considerable part of their revenue from the cultivation of this plant. The amount of tobacco exported from Virginia in 1622, was 60,000 pounds; in 1639, 120,000 pounds; in 1758, 70,000 hogsheads."—*Patent Office Report.*

The hogsheads, at that time, were about 600 pounds. Larger hogsheads and closer packing have since been in use; the quantity per hogshead has gradually increased, and now often reaches 1,800 pounds, averaging probably as high as 1,300.

It appears, from official documents, that the yearly exports of tobacco for ten years, ending with 1709, averaged 28,868,666 lbs. From 1744 to 1772 the average exports were 40,000,000 lbs. During the four years preceding the Revolutionary war the exportations were as follows:

1772	97,799,263
1773	100,472,007
1774	97,397,252
1775	101,828,617
Total the four years	397,497,139
Average for same time	99,374,785

This shows, that, at the commencement of the Revolution, the exportation had reached a little more than 100,000,000 lbs., it having been almost 2,000,000 above that figure for the year immediately preceding the war, and falling but little short for the three preceding years. During the Revolution the exports were; for

1776	14,498,500
1777	2,441,214
1778	11,961,533
1779	17,155,907
1780	17,424,267
1781	13,339,168
1782	9,828,244
Total exports these seven years...	86,648,833
Average for same time	12,378,504

How the smokers of Great Britain contrived to make themselves comfortable through the revolutionary years, is not easy to say. But it is probable that there were large invoices on hand at the breaking out of the war; and it is quite possible that the London dealers had learned then—what they have certainly practiced largely since—how, from one pound of good, fragrant Virginia tobacco, to make a great many pounds of a mixed stuff, which the consumer could be persuaded to purchase at a high price. Possibly the English thought a medley, which they could produce, mostly from herbs grown on their own soil, quite good enough for their cousin-germans; for we hear of their shipping largely of something, that passed as tobacco, to Germany and other parts of the Continent, during the war. It will be

but a slight digression to say here that considerable British soil has, at a much later period, been shipped to Germany, and sold as guano; and that when England accuses us of being fraudulent, she might well look a little at her own adulterations. It is quite possible that those Hessian soldiers, who did her fighting in this country, were paid in tobacco, which had more of the name than of the nature of American.

It is a singular fact, that, from the close of the war of the Revolution, the exports of tobacco remained just about stationary for sixty or more years. It can be accounted for only on the ground, that the dearth of tobacco, during the Revolution, induced the nations of Europe to commence its cultivation for themselves, and that they have kept up the home production ever since. The adulterations practiced by the English, and perhaps by others, would naturally tend to the same result; for the people, of course, found that the tobacco grown in their own gardens was about as good as they could purchase under any names whatever; and the conclusion was, that they could grow it cheaper than to purchase. Will the effect of our present war be to stimulate the growth of cotton otherwhere, and thus lessen the demand on this country? Time will answer. That the former war did lessen the demand for tobacco, and that very permanently, extending sixty years at least, if not to the present time, is certain.

Previously to about 1840, Virginia, Maryland, and North Carolina seem to have been the principal tobacco-growing States. Since then the cultivation has become extensive in Kentucky, Tennessee, Missouri, and other western and north-western States. Ohio, Indiana, and Illinois are now largely in the business. New York,

New Jersey, Pennsylvania, Delaware, and even some of the New England States, are finding it profitable. The alluvial soils of the Connecticut River, both in Connecticut and Massachusetts, as also in portions of Vermont and New Hampshire, are found to produce tobacco of an excellent quality, and at a profit, as prices have averaged the few years past, much above the profits of general farming. Its cultivation seems to have commenced in Virginia almost from the first settlement at Jamestown. Sir Richard Granville is said to have discovered it there in 1585. The English, then, for the first, saw it smoked by the natives, in pipes made of clay.

COMMERCIAL VALUE.

The census of 1850 makes the quantity of tobacco grown in that year 199,752,655 lbs., and the value a fraction less than $14,000,000. In 1851 the value of the exported tobacco was about $9,250,000. In 1852 the value of exports of tobacco was estimated a fraction over $10,000,000, and it reached $11,319,319 in 1853. Ever since Virginian colonists paid their clergymen's salaries in tobacco, and bought them wives from the old country with the same currency—not, as we suppose, that the tobacco was paid to induce the "comely young women, of sound health and good morals," to come into that relation; since then, as now, young women of this description could have been "nothing loth" to become the wives of such men as the early settlers of Virginia, but rather to furnish an outfit and defray the expenses of the voyage—from that time to this, tobacco has been among our most important exports, in its commercial relations, and will probably be increasingly important long to come. The

quantity grown in 1860, was 429,390,771 lbs. From this brief view of its history and commercial relations, we turn to its cultivation.

II.—CULTIVATION OF TOBACCO.

SOILS REQUIRED.

In a mere speculative view, without the least experience, one might come to some conclusions, which would not be far from the truth. Because tobacco seed is minutely small, and the young plant delicate, and for a time of slow growth, we might conclude, that it should have a soil capable of being very nicely and evenly worked. Because it is subsequently of rampant growth, and requires, in order to best meet the interest of the cultivator, to put forth its voluminous foliage in a short time, we might infer that it should have a soil abounding in organic (vegetable and animal) matter, and that, in an advanced state of decomposition, so that when the plant takes to towering and spreading, it should have plenty of food about its roots, in a high state of preparation, cooked in advance, if we may use that term, and all ready to be taken in by the plant, and assimilated. And because analysis shows that tobacco abounds in the alkalis, especially in potash, we might infer, that the soil should be well supplied with alkaline matters, as in the case of virgin soils, just cleared from the forrest, or those, which, having been long cultivated, have been well manured for previous crops. We might infer, also, that if a sod be chosen, it should be plowed

beforehand, at least as long as the preceding autumn, in order that the grass roots and other organic matter might have come into a soluble state in time to supply the plant at its rapidly growing period. One might almost infer, also, from the nature and habits of the plant alone, that, in high latitudes, a lightish, rather sandy soil would be preferable, because suited to bring the crop forward earlier than any other, but that in lower latitudes, with long summers, a heavy loam, or even a clay soil might do well.

OPINIONS OF PRACTICAL MEN.

But we prefer to turn from what may be censured as mere speculation and theory, to the testimonies of acute observation and practical experience. Thaer, in his *Principles of Practical Agriculture*, says :

"Tobacco prefers a light soil ; it thrives better on a sandy, than on an argillaceous soil. Sandy clays agree with it best ; but it is also successful on soft clays, which contain a large quantity of humus. But to produce a perfect and plentiful crop, the land must be rich in ancient humus ; and must, besides, have been recently fertilized with some sort of manure. The best tobacco is that which grows on clearings, especially if the turf which covered the surface has been burned upon them ; and still better if the wood which grew upon them, or wood brought for the purpose, has also been consumed on the spot and reduced to ashes. It is certainly, to this treatment, rather than to difference of climate, that we must attribute the great superiority of the American tobacco, which is grown not on land recently dunged, but on the contrary, after ten or twelve crops, all obtained without the use of dung, on the rich and burnt clearings."

Judge Adam Beatty, Vice-President of the Kentucky State Agricultural Society, at the time of writing the treatise on tobacco culture, from which we quote, said:

"Tobacco requires a rich soil, and that which is new, or nearly so, answers best. Next to ground which has been recently cleared, lands which have been long in grass, especially if pastured by sheep, answer best for tobacco. In preparing ground for tobacco, great care should be taken to plow it deep, and pulverize it completely. Grass land intended for tobacco, should always be plowed the previous fall. And it is better that all kinds of land intended for that purpose, should be plowed in time to have the benefit of the previous winter frosts. It should be kept light and free from weeds, by repeated plowings, till near the time of planting."

Allen's *American Agriculture* says:

"The soil may be a light, loamy sand or alluvial earth, well drained and fertile. New land, free from weeds, and full of saline matters, is best for it; and next to this, is a rich grass sod which has long remained untilled. The seed should be sown in beds which must be kept clean, as the plant is small and slow of growth in the early stages of its existence, and easily smothered by weeds. If not newly cleared, the beds ought to be burned with a heavy coating of brush."

In the *Prairie Farmer* of December 27, 1862, we find the following by Jonathan Periam, we presume a practical Tobacco Cultivator: "Tobacco, being so much affected by soil and climatic influences, cannot be raised in all situations, even where it will mature. In rank soils, it will be strong and acid, and the price obtained for it will not be sufficient to pay the cost and trouble of raising. In exposed situations, subject to strong

winds, it will sometimes be entirely ruined, by being broken and bruised. Indeed, in some situations, good wrappers can scarcely be obtained at all. In lands highly manured with nitrogenous manures, it will consist so much of nitre, that it will spit and fume in burning, which can only be tempered by age ; therefore, after making the land sufficiently rich, some other crop should precede it. The best soil is thought to be a deep sandy loam, rich in potash, lime, soda, and carbonaceous matter."

The distinctive requirements of tobacco, as regards soils, and still more as regards climate, resemble those of Indian corn. Hence we find that, as a general rule, the best corn-growing regions of our country, have hitherto most largely grown tobacco. Lorin Blodget, author of an able essay, in the Patent Office Report, on climatology, has these remarks :

"Wherever the growth of corn is completely successful, as in districts of a temperature for July above 68°, tobacco is and may be freely grown. Connecticut, Central New York, Ohio, and parts of Michigan, Indiana, Illineis, and part of Iowa, are all scarcely less adapted to tobacco culture than Kentucky and Virginia. The chief difference is a slight limitation of its period in time, and experience has fully shown that, to this extent, this may be very safely effected by a little care in selection of varieties.

Southward, its range is, also, like that of maize, with perhaps the exception of producing more desirable varieties in tropical climates. Cuba is the favorite of all known districts indeed, and there seem to be no dangers to this plant from tropical excesses either of heat or humidity during the period of growth alone.

The editor of the *Country Gentleman*, July, 1862,

says : "Tobacco requires a warm, rich, mellow soil." In a previous number of that work, we find from the pen of Hon. Geo. Geddes : "A warm, rich, well-drained, mellow soil, and then twenty-five loads of rotten barn-yard manure, should be put on an acre."

With regard to the quality of the land required, perhaps enough is said. These views are those of a man eminently scientific and equally practical. Judge Beaty's are those of a man decidedly practical and of great experience. Mr. Periam's, as quoted from the *Prairie Farmer*, admirably discriminate cases of soil and exposure, where it would not be well to undertake the cultivation of tobacco. And we have not yet heard of the man, whose opinion on such a subject we should more highly value than that of the Hon. George Geddes. His twenty-five loads of well-rotted manure, on soil already deep, mellow, and rich, implies something like fifty loads of green manure, which, at first thought, looks rather steep ; but then it is to be recollected that 2,000 to 2,500 lbs. of tobacco is the return reasonably to be expected from such doings, and that the land will give forty bushels of wheat the next year, or any other crop in proportion, and will then give clover and herds grass in abundance for years to come, without further manure. The idea from the Patent Office Report, that wherever corn will grow tobacco may be cultivated, is undoubtedly correct ; and yet Mr. Periam, in the *Prairie Farmer*, has shown that on some lands of rank soil, and others of windy exposure, it would not be well to undertake the cultivation of tobacco.

"Warm," "deep," "rich," "not exposed to violent winds," seem to be the requisites of all these and other writers on the subject. Our own opinion is, that warmth

should be more insisted upon by the northern man; depth and richness, by the southern. The northern farmer is to secure warmth by selecting an alluvial, sandy soil, or a light warm loam, and then to increase the warmth by abundant manuring. He must get a large crop, or it will not pay for cultivation in his expensive way. The southern farmer, on the other hand, we think, may depend for warmth more on his sunny climate, insist more on depth and richness of soil, use perhaps less manure, and be contented with a less crop. We are not sure, that moderate manuring and 1,200 lbs. of tobacco to the acre, are not quite as good evidence of wise husbandry in Virginia, as very heavy manuring and 2,000 lbs. of tobacco to the acre are in Massachusetts; though there is this difference, that the former will always exhaust the soil, while the latter will as surely enrich it.

III.—TREATMENT OF THE SOIL PREVIOUS TO SETTING THE PLANTS.

If, in turf, it is better that it should be plowed the previous autumn, both that the frost may help to pulverize it, and that the vegetable matters may be progressing to that condition in which they can be taken in by the crop at its rapidly growing period. If not in turf, it is of considerable consequence that it should have been nicely cultivated and well manured for the former crop. At any rate, if not plowed in the fall, it should be plowed early in the spring, and the manure for the

crop plowed in. The plowing should be deep. Composted manure, well rotted, and worked fine, is the most suitable ; though we have known some of the best crops ever grown, to be grown with long, green, barn manure only, and that not applied till nearly planting-time. But this was on warm, sandy land. The application of such manure at a late day before planting, certainly could not be recommended for other than very warm land, and hardly for this. In slow soils, there would be danger of its not becoming sufficiently decomposed to afford its elements to the crop while in its rapidly growing stage, say in June and July. After plowing in the manure, the soil should not lie still. The oftener it is plowed, harrowed, rolled down, and plowed up again, crushing, mixing, and pulverizing, the better. This should be kept up, with occasional rests only, till the very day for transplanting ; and the soil should then be in the condition of a most perfectly prepared seed-bed.

All this may not be essential to the obtaining of a fair crop ; we do not suppose it is ; but it is essential to a large crop of a uniformly high-priced tobacco, and therefore we say it is necessary in order to the best profits. The extra labor is not lost, but much is gained in consequence of it. On the alluvial soils of the Connecticut River, in Massachusetts, one would think, on seeing the farmer work his field for tobacco, that he never would get pay for so much labor. But wait for the report of autumn, and see.

We once saw a man in that region putting in sixteen acres. There was none of the "nothing venture nothing have" about him. We confess to having been alarmed at his expenditures. In addition to immense heaps of compost, one-third from the barn yard, and two-thirds

from a muck swamp, thoroughly worked over, fermented, and pulverized, he applied, at the last of many plowings, a heavy dressing of Peruvian guano, and then, if we are not mistaken (are not quite sure about this), spread super-phosphate on the surface the last thing before setting, and men and teams had been busy with the soil from early in April till late in May. About seven months after, we met this man in New York, and learned that he had the refusal, from a reliable dealer, of fifteen cents a pound for his entire crop—2,500 lbs. to the acre, which, on his sixteen acres, would, of course, be 40,000 lbs.

The upshot was, that, before the week was out, he refused the offer, and subsequently obtained a higher price. Ordinary tobacco was then selling at but little more than half as much as was paid for his. The great excellence of his made the difference. Was not this man's extra manuring and labor richly compensated in the extra quantity and quality of the crop?

But this is not an isolated case. There are many in the same region, if not quite as remarkable, strongly resembling it, in the main features, at least showing high and careful cultivation and highly remunerative returns. In the cultivation of tobacco, as with most other crops, too much attention can hardly be given to a *right* and THOROUGH preparation of the soil for the intended crop. Perhaps but few fields are sowed or planted in the older parts of our country, where a few days' extra labor in preparing the soil, and a little more expense in enriching it, would not increase the profit.

It will be observed that our remarks on the choice of land and its preparation for planting, have a special reference to the high cultivation beginning to prevail

in many parts of the North and East. The following, from the pen of the lamented Peter Minor, of Albemarle County, Virginia, may better meet the wants of sections where land is yet new and plenty. Mr. Minor is characterized by Col. Skinner, who published it, in *The Plough, the Loom, and the Anvil*, in 1852, as "a good farmer and a better man." He says :

"The best tobacco is made upon new or fresh land. It is rare to make more than three successive crops upon the same ground, of which the second is the best, a the first and third being about equal. But it is more common to make only two. The new land, after all the timber and brush is removed, and the surface very cleanly raked, is twice closely coultered as deep as two horses or oxen can pull. After this, hands with grubbing hoes pass regularly over the whole ground, and take up all the loose roots that have been broken by the coulter, which are heaped and burnt, or removed. One, and sometimes two more coulterings are then given, and the same operation repeated with the grubbing hoes."

Mr. Geddes' remarks on preparing the ground imply somewhat less manipulation of the soil than we have often seen practiced with the best results, and have, in a former paragraph, commended. They are as follows : "To prepare the land, the manure should be applied as early as the ground is dry enough to plow. The last of May plow and harrow again, so as to mix the manure well with the soil." J. Periam, a correspondent of the *Prairie Farmer*, very truly says :

"The most thorough preparation of the soil is required to the successful cultivation of tobacco. If not previously done, it should be thoroughly subsoiled in the fall, to the depth of at least twelve or fourteen inches, by following after the turning plow with a subsoil lifter. As soon in the spring as the land is in condition

to work, cart on twenty-five loads per acre of well-rotted manure, spread evenly, harrow and plow about six inches deep. As soon as the weeds start, harrow again. About the 20th of May, give it a final plowing, and harrow again thoroughly, and if not sufficiently fine, roll.

IV.—PREPARATION AND MANAGEMENT OF THE SEED BED.

While the field for the crop is being prepared, or still earlier, if the season permits, the bed for growing the plants should be made. Some prepare this the fall before. If well prepared, as soon as the frost leaves the ground in spring, it is as well. The ground should have a warm exposure, on the south side of a board fence, or on a southern or eastern slope, or on the sunny side of a building, or of a piece of woods. Two ways have been adopted for producing the requisite warmth at so early a period—one by the application of plenty of manure, the other by burning. We do not consider the burning process absolutely essential; for we have seen excellent plants grown without it, in northern latitudes, and in good time for transplanting. But we choose that practical men shall be heard on this subject.

The following is the direction of Hon. George Geddes:

"To raise the plants, the fall before pulverize the bed fine, and mix with the soil hog or some other manure that has no foul seeds in it. Sow seeds on the well-raked bed, as soon as the ground can be properly prepared in the spring, about one ounce to a square rod, equally distributed all over the bed. Roll hard with a hand-roller, but do not cover the seed. Glass should be kept

over the bed until the plants appear, which will be in two or three weeks ; after they are up and started, the glass will be required only at night, and in cold days. The bed should be kept moist and free from weeds. When the plants are three inches high they are large enough to set."

As the growing of the plants, so as to have them of good size, and vigorous, in time for transplanting, is a point of much importance, we quote other authorities, with the hope, that, as they come from different sections, they will prove instructive to a greater number of readers, than would the sugestions of any one person, drawn from a comparatively limited practicé and observation.

The following are Mr. Minor's directions for the seed-bed :

"A rich virgin loam with a slight mixture of sand is ascertained to be the best soil for raising tobacco plants. Such spots are indicated by the growth of alder and hazel bushes in bottoms, and on the margin of small streams, and if the situation has the command of water, for irrigation, it is on that account to be preferred—the spot being selected, the first operation is to burn it with a strong fire. For this purpose the growth of ever kind is cut off (not grubbed up), and the whole surface raked very clean; the burning should be done before Christmas, or as soon after as the weather will permit—and if done thus early it cannot be well too heavy, even bringing the soil to a hard cake.

"The wonderful fertility imparted to soil by fire, has of late years been clearly proved and developed by various experiments in this and other countries, but judging from long-established practice, we suppose it is a fact that has been long known to tobacco planters, that this fertility is imparted by the fire, and no ways dependent upon the ashes left by the process, is clearly

proved from the fact, that the same results will ensue if the ashes are swept off clean. Or take another piece of ground of equal quality, cover it with as much or more ashes, and prepare it in every respect similar, except burning, and plants cannot be raised in it. Hence the necessity and propriety of regular and uniform burning, the want of which is always manifested by a diminutive, yellow, and sickly growth of plants in those spots not sufficiently acted on by the fire.

"After the ground becomes cool from burning, the whole surface should be swept with a coarse twig broom to take out the coals. In this operation some of the ashes will be removed, but that is of no consequence; it should then be broken up about two inches deep, with grubbing hoes, in which operation and in repeated choppings afterwards, with hilling hoes, all roots will be cut, and finally got out with a fine iron-tooth rake, which leaves the ground in proper order to receive the seed.

"The most approved time for sowing is about the 1st of February, the beds previously prepared being suffered to lie and mellow by the frost and snows to that time. But it will do very well to burn and sow after that time, as late as the first of March, taking care not to have the heat so great. The quantity of seed is as much as can be taken up in a common table spoon* for 100 square yards, and in that proportion. This quantity of seed should be mixed with about one gallon of clean ashes, and half that quantity of plaster of Paris, and the whole well incorporated, and then strewed uniformly over the bed at two operations, crossing at right angles to ensure regularity. Cabbage seed, for early planting, Tomato, Celery, and Lettuce seed may be sowed in small quantities with the Tobacco seed, without injury to the growth of the plants.

"After sowing the seed the ground is immediately

* This quantity of plant bed is generally considered, under good circumstances, as sufficient to set ten thousand hills in good time. But the prudent planter, taking into consideration the casualties of fly, drought, &c., will do well to make a large allowance. We know of no certain remedy or antidote against the fly which destroys the early plants.

trodden over closely with the feet, and covered thick with naked brush. If the frost is severe from this time it is common to take off the brush some time in the month of March, before the plants appear, and tread the bed again, and at the same time give the ground a slight dressing of manure. The dung of fowls of all sorts, is sought after for this purpose, which being beaten, is sifted over the bed through a coarse basket or riddle. The brush is then restored, and not finally removed until the leaves of the plants are half an inch in diameter; when the dressing of manure is again applied taking care to wait the approach of rain for that purpose. Any grass or weeds that may have sprung up in the mean time are carefully picked out. In dry seasons, if the situation admits of it, the bed must be irrigated by draining a small stream of water around the edge of it. If not it should be watered every evening with a common watering pot, or pine bushes dipped in water and shook over the bed until sufficient moisture is obtained.

"Under a careful observance of this management, the plants, according as the seasons have been favorable or not, will be fit to transplant from the 15th of May to the 10th of June. A planter thinks himself lucky if he can get his crop pitched by the 10th of June. After that, the seasons are uncertain from the heat of the weather, and the chances of success for a crop are precarious; though it has been known to succeed when planted in the middle of July."

In the *American Farmer's Encyclopædia* are the following directions, taken, probably, from practice of medium latitudes:

"The land for the *plant bed* is usually selected in a warm exposure on the south or south-eastern side of a hill in a wood, new ground being always preferred. From this the roots should be grubbed, the rubbish cleared away and the old leaves raked off. Brush of pine or other wood is then to be piled on, until from 2 to 3 feet thick all over the bed, and this is to be set on

fire. As the beds should be prepared for seeding immediately after the frost is out of the ground, the brush should be collected, and put in place some time during the winter. Instead of burning over the whole bed at once, a part may be fired for an hour or so at a time, proceding thus over the entire bed. The place is then to be broken up with hoes, and sometimes with coulters, drawn by horses or oxen, and the work repeated until the earth is made perfectly fine, being careful to avoid turning under the surface. All the roots should then be extracted, and the land laid off in beds (slightly elevated if dry, and more if moist or wet) 4 feet wide. And to 16 square yards, a common pipe-bowl of seed is sown. The bed is then trodden or pressed with hoes, and well covered with brush to protect the plants from frosts. When the plants have come fully out, they should be slightly manured with strong manure made fine ; this should be repeated frequently, and in larger quantity, as the plants increase in size and are able to bear it.

"When the plants have attained a good size, and there is no longer danger of frosts, the covering of brush is removed, and the bed weeded with the hand, those employed in this duty taking great care to avoid bruising the tender plants. The beds require frequent picking to keep down the weeds."

The following, by Judge Beatty gives, no doubt, what the author regards as the best practice for Kentucky :

"The first step in the process of tobacco culture is to make provision for an abundant supply of plants. Tobacco seed are very small, and the plants, when they spring from the ground, grow very slowly, and would soon be smothered by weeds if not carefully guarded against. The places selected for plant beds, should be such as would not be likely to produce many weeds. New ground or that which has been long set in grass, would be best for this purpose. To guard still further against weeds, and to insure a thrifty growth of plants, it is essential that the place in which the seed are to be sown,

should be burnt. A light burning with straw or other light material will not be sufficient. A good coat of brush laid upon the ground intended to be used for a plant bed, and arranged so closely as to make it burn readily, serves best for the purpose. Care must be taken also, before laying on the brush, to take all trash from the ground, so that the heat may readily destroy the seeds of any weeds which may have been deposited there. New ground is always to be preferred for plant beds, and brush as the material for burning the ground. But if the tobacco planter have no new ground, then he must substitute grass land in its stead, and this should be well burned by having a range of logs (those which are seasoned are best) laid along one edge of the ground, intended for plant bed, and heaped up sufficiently to make them burn readily These must be set on fire, and after burning the ground which they cover sufficiently, they must be moved by means of hooks, to the adjacent ground not yet burnt ; and so on, in succession, until the entire space, intended for a plant bed is burnt. If one set of logs is not sufficient to burn a space as large as will be necessary, others must be added so as to enlarge the space, or they may be burnt at different places as may be most convenient.

"Where sod ground is intended to be used, it would be advantageous to have the sod slightly skinned off with sharp hoes, before the space is burnt over.

"After the ground is burnt it must stand sufficiently long to cool, and then the ashes should be carefully removed. The ground should now be dug up with hoes, to the depth of two or three inches, and so as to pulverize it as much as possible, and should be well raked with an iron tooth rake, so as to break up the soil into the most minute parts. It will now be ready for sowing the seed. It is important that this operation should be as regular as possible, and care should be taken to put the proper quantity of seed upon the ground. If sowed too thick, the plants will be so much crowded as to injure their growth. If sowed too thin, a deficiency of plants may be the consequence. A common silver table

spoonful of seed will be sufficient for fifty square yards. More than that quantity should not be sowed on that space of ground. But if the ground prepared be abundant, the plants would grow more thrifty by sowing a spoonful of seed on seventy or eighty square yards. The seed allotted for a particular bed should be put into a vessel half filled with fine mould or earth, and stirred so thoroughly as to cause the seed to be equally distributed in all parts. It should now be separated into two equal divisions. And the plant bed having been divided into convenient lands for sowing, one portion should be sowed as equally as possible in one direction, and the other portion in the same bed, in the opposite direction. The plant bed should now be well raked with an iron tooth rake, both ways, and should then be well trodden by the feet of men or boys, so as to render the loose soil firm and compact. The bed should be thinly covered over with brush to keep it moist, and to protect the plants from frost. Plant beds should be prepared and sown as early in February as the weather will admit ; though it will be in good time if sown any time in that month."

From a statement of R. H. Phelps, of Windsor, Hartford County, Conn., found in the Patent Office Report for 1853:

"The Connecticut mode of management is nearly as follows : The seed is sown as soon as the ground is free from frost ; or if not, a quantity of bushes is burned upon the ground to warm it, and kill all the seeds of weeds, &c. It is then trodden down compactly, in order that the seeds, which are small, may come closely in contact with the earth. Guano is said to act with good effect in giving the plants an early start, which is to be attained if possible."

From Allen's American Farm Book :

"Pulverize the beds finely, and sow the seed at the rate of a tablespoonful to every square rod. The seeds are so minute, that sowing evenly is scarcely attainable, unless by first mixing with three or four times their

bulk of fine mold. This should be done sufficiently early to secure proper maturity to the plants in time for transplanting (by the last of February or early in March south of the Ohio, and about the first of April north of it), covering lightly and completely rolling or treading down the earth. The plant appears in fifteen or twenty days, and will be fit for transplanting in six or eight weeks."

From the Prairie Farmer of January 3, 1863, *by J. Periam :*

"About the 1st of April, the hot-beds should be prepared thus: Having previously drawn sufficient fresh heating horse manure into a conical pile, and turned it at intervals of three days, to get the rank heat out of it, mixing the dry and wet together, a space should be cleared fifty feet long and eight feet wide, upon which proceed to lay up the manure about sixteen inches high; spread it evenly, long and short, patting it down from time to time with the fork, to discover the soft places and make it pretty firm. To heat properly, the manure should be uniformly moist; if too dry, it should have been moistened while in the heap. If that has been neglected, it may be done at the time of making the bed. Frames should have been prepared by nailing boards on posts, which may be sixteen inches for the back by twelve inches for the front.

The frames, when finished, should be of sufficient width to accommodate sashes six feet long, and if in length sufficient for four sashes each, strips should be fastened to the frames at proper intervals for the sash to slide on. The sash should be made of clear two-inch pine, in the best manner, with slats sufficient for eight by ten glass, four rows of glass to each sash, the glass lapped together so as to shed rain. Use eight by six glass if you can them, as there is less loss by breakage. Place the frames upon the bed of manure, and put in two or three inches of rich earth, free from the seed of weeds, woods mould and strong loam, equal parts is good, to to which may be added a little well-rotted hog manure,

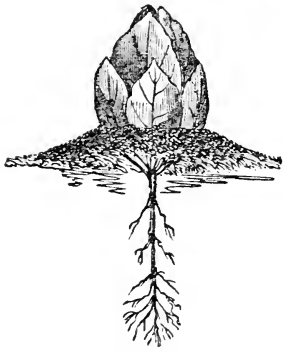
now put on the glass, and when the thermometer ranges between 50° at night and 80° during the day, your bed is just right. Now add three or four inches more of the same kind of earth, and the next day after raking all smooth and level, sow about one ounce of seed, to the range of beds six feet wide and fifty feet long. This, if successful, should give good plants enough for two acres, or at three inches each way in the bed, enough for one acre. Do not cover the seeds in the beds, but pat the earth down, thus pressing the seeds into the earth. Cover and keep moist until they germinate, which should be in about ten days. After the plants are up, they should have plenty of air in pleasant weather to make them hardy and stocky.

More plants are destroyed in hot beds by novices from keeping too close than in any other way. Water at sufficient intervals with slightly warm water, generally about noon, and cover all with hay or mats in cold weather. Extra fine plants may be obtained by making a second bed, the last week in April, using only twelve inches of manure, and transplanting therein about the first of May, the best plants from the first bed, three inches apart, and shading until they get established, using shutters and hay to cover with in cold weather, or a cold frame may be used, which is simply a bed without bottom heat. In this case the glass must be transferred from the first bed to the second, and the first one covered with shutters and mats or hay. Remember that they are very susceptible to frost, and want careful watching. In case you pursue the latter course, the first bed may be made about the 20th of March, ten days earlier than first suggested.

Another way, somewhat practiced, is to dig up a piece of ground in a sheltered situation, free from frost, and burn thereon a quantity of straw. After raking thoroughly, sow the seed at the rate of one ounce to the square rod, beating the ground smooth, and cover with brush until the seed germinates. A pen should be built around this, so that it may be covered in cold nights with boards and hay. The pen to be banked up at the

sides, and here let me remark, that all the hot-bed frames should be carefully banked up also, and the frames should be so arranged that they will pitch toward the south so as to shed off the water and lie towards the sun. By following these rules, the very best plants may be obtained, and the success of the crop depends as well on good plants as thorough cultivation. I successfully ripened the last season, the small leafed Cuba variety and Connecticut seed leaf, not only the leaf but the seed; and I have at this time about six quarts of each kind. Care should be taken in procuring seed, as it soon deteriorates from climatic influences and unskillful culture. Many persons who cultivate but little, prefer to buy their plants. If so, the ground should be properly prepared beforehand, so that they may be set as soon as received, in which case, no matter how dry the land, they may be preserved by watering, as heretofore directed."

V.—TRANSPLANTING.



The plant as it should be set.

The plant as set.

Designing this manual to be mainly a compilation or gathering of the best practical authorities on tobacco culture, we here introduce directions, which we consider instructive and reliable :

From the Report of Hon. Geo. Geddes, of New York.

"Mark the land one way for rows, three feet four inches. Make hills by hauling up a few hoes full of dirt and press it well with the hoe. In taking the plants from the bed take care to keep the roots wet. Unless the ground is quite damp, put a pint of water on each hill half an hour before setting. Make a hole, put in the root, and press the dirt close to it, all the way to the lower end. If any plant does not live, take care to set another. Unless the earth is wet, or at least moist, water the plants as soon after setting as may be necessary. In about one week, cultivate and hoe."

From an Essay of Peter Minor, Esq., of Virginia.

"It is most common to wait for rain, or *season* as we call it, to perform this operation, in which case the hills must be previously cut off about four inches above their base; but in early planting it is quite safe to proceed without a season, provided it is done in the evening, and the hills cut off at the same time. It is universally admitted that a moderate season is better than a very wet one; and that is considered the best, in which the earth does not entirely lose its friability, but at the same time will bear to be compressed closely about the roots of the plant without danger of becoming hard or baked. Under the most favorable circumstances, however, some plants will fail or perish, and therefore the ground must be gone over after every rain until the last of June to replant the missing hills."

From the American Farmer's Encyclopædia.

"The plants will be generally ready for removal about the last of May or first of June. They are to be drawn out after a rain and transplanted in good ground previously well prepared for their reception."

From the American Farm Book.

"This should be done in damp weather, and the plants set singly, at a distance of two and a half to three feet each way. The after-culture is like that of corn, and

consists in frequently stirring the ground with the plow or cultivator and hoe, and keeping down weeds. The places of such plants as fail or are blighted, should be at once filled up, and all worms destroyed."

From Beatty's Southern Agriculture.

"The field should be laid off into ridges, by a single horse plow (to prevent the ridges from being trodden by the off horse), from three to three and a half feet from centre to centre, according to the kind of tobacco which is intended to be planted. The ground should be crossed at the same distance, by a shovel plow, or one with a double mould board. The ground will now be in a condition, requiring nothing more to be done to prepare for the planting, but to cut off the centre of the square or ridge with a broad hoe. This last operation should be performed when the plants are of sufficient size for setting, and should be made only so many at a time as there will be plants to fill the first *season* that happens. Plants can only be set after a rain, and much care should be taken in this operation, for if plants are well set they will grow quickly, but if badly set they will be kept back some time, and many hills will require to be replanted. This will cause much additional labor and render the crop irregular as to the time of ripening."

From R. H. Phelps' statement in the Patent Office Report, we take the following :

"A moist time is preferred for setting out the plants (about the 15th of June in his locality, near Hartford, Conn., or when the leaves of the plants are about the size of a silver dollar), when they are placed in rows about 3 by 3½ feet apart.

From the Prairie Farmer of January 10, 1863.

"Mark out in ridges, three feet feet, four inches apart, which may be done with a winged shovel plow. Then cross at right angles at the distance of thirty inches, and the land will have been divided into hills three feet, four inches one way, by thirty inches the other. The hills may now be dressed up with a hoe, if necessary,

and patted down, so that they shall be somewhat rounding, and about twenty inches broad near the base. The ground may be left until a proper day comes for planting—cloudy weather, with indications of rain is the best; if not, as soon after the rain as the ground is in suitable working order.

As good a plan as any, if the weather is dry, is to make a hole in each hill, and pour therein about a pint of water, and set the plant as soon as it has soaked away, drawing the dryer earth about it, which may be done very quickly by having one hand to water, while another sets the plants. If the hills have become weedy between the fitting and the planting of the land, they should be scraped before planting, by making quick, shallow cuts with a hoe, just beneath the surface. In extensive cultivation, a division of labor of this kind will save a large expense, in the crop.

If the weather continues dry and hot, they should be slightly watered about nine o'clock in the morning, and again about three P. M., if they show a disposition to wilt. Reset immediately if the plants are destroyed by worms. Considerable care is sometimes necessary in order to get a good stand. Setting the plants is performed, by thrusting the left hand deep into the soil, and placing the plant properly with the right, and pressing the dirt pretty firmly about it."

VI.—CULTIVATION AND PROTECTION FROM PESTS.

In a week or ten days after setting, cultivate and hoe. Repeat the operation as often as once in ten days, and keep the ground loose and clean till the crop is too large to be worked among. During the early part of this time keep a sharp look out for the cut-worm; he *must be killed.* As soon as the tobacco worms show themselves, they must be killed "double quick," or your labor will have been lost, for they eat tobacco faster than a pot-house politician. The *pruning and topping* must be attended to, and the suckering is necessary, in order to throw the

strength of the plant into the leaves. Here again we quote from practical men, as to when, and how these operations are to be performed.

Hon. George Geddes says :

"When the blossoms appear, break off the stalk, leaving about fifteen leaves, taking off about seven leaves. After topping, break off the all the suckers. In about another week, go over again, breaking off suckers and killing worms. In another week repeat the operation."

Mr. J. Periam in the *Prairie Farmer* for January 17, 1863, says :

"After the first of July look out for worms upon the leaf, and from this time until harvested, great care will be necessary, in keeping them down, and removing the suckers as fast as they appear. When the plant has begun to form buds, it should be topped as represented in the cut, at *b*, leaving from nine to fifteen leaves, according to the strength of plant—the latter number is not too many for strong healthy plants.

From this time until the crop is ready to cut, it will be necessary to go over it as often as once a week, and remove suckers, as they appear, keeping a sharp look out all the time for worms, killing them as fast as they appear, by throwing them on the ground and scraping them with the foot. They are a large green worm such as often appear on tomato plants, and are more destructive to the crop than anything else. If the directions have been properly attended to, by the middle of August the crop will have entirely covered the ground ; hereafter the utmost care must be used not to break the leaves in passing among the plants, and in consequence, some people neglect the suckering and worming, to do which would be fatal to the crop. The plant with suckers growing is shown in the cut.

Turkeys are sometimes used for picking off the worms by calling them to the field with corn, but think the better way is to keep help enough in the field to get over the crop about once a week, which will enable them to look for

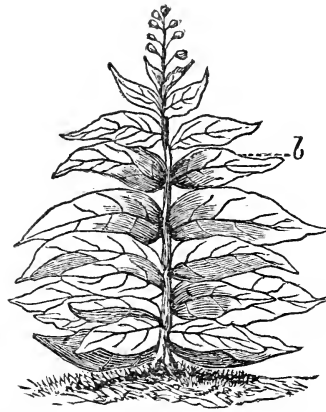
worms constantly. When the suckers have all made their appearance, down to the ground, and been pulled as fast as they have shown themselves, the crop should be ready to harvest. This may be known by the leaves assuming a mottled appearance, and by their cracking when bent over, and also by their being of an uniform size and appearance from top to bottom."

The plant in full blossom, as when left for seed.

From Mr. Minor, of Albemarle County, Va.:

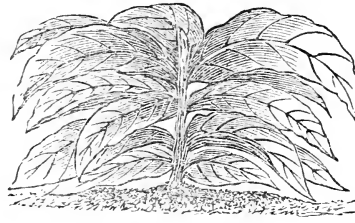
"When the plants attain a proper size, which observation and experience will readily point out, they are to be primed and topped. The priming is merely stripping off four or five leaves at the bottom, leaving about a

hand's breadth between the first leaf and the top of the hill. Topping is simply taking out the bud with the finger and thumb nails, leaving the necessary number of



A plant ready to top, place for topping indicated by *b*.

leaves, which in general is not more than eight, though the first topping may be to nine or ten leaves to make it ripen more uniformly, and bring the crop into the house more together. For the same reason, the late



Plant after topping.

plants are not topped to so many, falling from eight by degrees as the season expires, down to six and five. A little practice, and slight attention to the manner in

which the leaves grow from the stalk, will soon enable a person to perform this operation with great dexterity

Plant needing to be suckered.

and dispatch, without counting the leaves. All that is requisite after this until the plant is fit to cut, is to keep it from being eaten by worms, and to pull of the suckers that grow out at the junction of the leaves to the stalk. These suckers put forth only twice at the leaves, but after that indefinitely and continually from the root ; and it is thought injudicious ever to let them get more than a week old, for besides absorbing the nutriment necessary to push forward, and increase the size and thickness of the leaf, the breaking them off when of a large size makes so great a wound as greatly to injure the after-growth of the plant. In general, about three months is requisite to perfect the growth of tobacco-from planting to cutting."

From the Farmer's Encyclopœdia, on Priming, Topping, Suckering, and Worming :

"As the tobacco plant grows and develops, a blossom-bud puts out from the top, which is termed *buttoning*. This top must be pulled off along with such of the upper leaves as are too small to be of any value. The plants are thus left usually about two or three feet high. The plants also shoot out suckers from every leaf, which

must be broken off, care being taken not to break the leaf from the main stem. This causes the leaves to spread.

The most regular topping is performed by measure. The topper carries in his hand a measure six inches long, by occasionally applying which, he can regulate the priming with great accuracy; and as the remaining leaves are numbered, this governs the operation, and gains the object of even topping. The topper should always carry this measure in his hand, as it serves to prevent excuses for negligence and uneven topping. Prime six inches, and top to eight leaves. We have found by experience, that this is the best average height. We sometimes, but seldom, vary from this general rule. If the land is poorer than common, or if, from the backwardness of the plant, and the advanced state of the season, we apprehend frost, we do not prime as high (say four inches). If we have an uncommonly rich spot, and there is danger that the top leaves will come to the ground, we should rise in the same proportion. The crop should be wormed and suckered, at least once a week."

From the Southern Agriculture, by Judge Beatty:

"When the crop is planted, its cultivation must be carefully attended to. The first thing to be done is to see that the cut-worms do not destroy the young plants. These must be sought after and destroyed. The plants must be kept free from weeds. In this operation both the plow and hoe should be used until the plants become too large to use the former without breaking the leaves. During the last plowing, tobacco should be plowed only during the heat of the day, when the leaves will have *wilted*, and will not easily break.

Tobacco is very subject to be injured by the horn-worm. This insect is very destructive, and, if not destroyed, will ruin the crop. The utmost care is, therefore, required, from an early period of its growth, to save the tobacco crop. From the time the horn-worm makes its appearance, the crop should be gone over once a week

till it is cut. *Topping* and *priming* are next to be attended to. The latter consists in breaking off the leaves next to the ground, which, to the number of four or five, are of no value. The number of leaves to which tobacco should be topped varies, according to the kind of tobacco raised and the season of topping. The *first* topping will always admit of a greater number of leaves being left ; and, in proportion as the season advances, fewer leaves should be left. The heavier kinds of tobacco are generally topped early in the season, to twelve leaves, then to ten, and still later to eight. The lighter kinds of tobacco are topped to a greater number of leaves. The above rule is only applicable to a rich soil. If the soil is light, the topping should be regulated accordingly, and fewer leaves left.*

Suckering is a much more tedious operation. Every plant requires to be twice suckered before it is ready for cutting. The first suckers are of quick growth, and should be removed before they become larger, otherwise they will not only injure the growth of the plants, but will sometimes break off the leaves in removing them.

Tobacco is usually planted from the middle of May to the last of June. And the cutting season commonly commences about the middle of August. A little practice will enable the planter to distinguish, very readily, the ripe from the green plants. At the first cutting the former must be selected and cut, leaving the others to become riper. When tobacco is ripe the leaves become spotted, with a greenish yellow color, and the leaves are so thick and ridged that, by folding and pressing gently between the thumb and finger, they will break or crack. But a little experience will enable the planter to determine which plants are ripe by *sight* alone."

Tobacco is liable to injury, like many other plants, by the cut-worm. The horn-worm, spoken of by Judge

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* Light tobacco, for segar wrappers, such as Roundleaf, Burleigh, and Summerville, should be planted three by two feet, and topped to sixteen or eighteen leaves.

Beatty, we suppose to be the same usually called the tobacco-worm in the North and East, a large green, and very offensive object, and an enormous chewer of tobacco.

The cultivation and protection of this plant, according to all the directions we have suggested and collected from what we regard as good authority, and, spread before our readers, would seem to be somewhat laborious, but more care-wearing and time-consuming. And yet we have often heard farmers of much experience say, that the cost of an acre of tobacco is no more than that of two acres of corn. This may be true, where the manuring is but moderate, the cultivation slight, the protection from enemies but partial, and the crop but small and not remarkably nice. But those who succeed in selling from an acre from 2,000 to 2,500 lbs., of so fine a quality as to bring them 8 or 10 cents more per lb. than average prices, we suspect find it necessary to expend much more than they would on two acres of corn, and certainly they can afford it, in view of the greater income from one such acre than from two of corn.

Hardly is the cut-worm out of the way, and sometimes the tobacco grower, soon after transplanting, has to hunt up, pursue, and slaughter two or three hundred of these per acre, day after day, before the *horn-worm*, *green-worm*, or *tobacco-worm*, as variously called, makes his appearance. Scarcely ten days in succession, from first to last, can the field be left to take care of itself. Three months of constant care and frequent toil attend the growth, and about as many more the harvesting, curing, and marketing.

We know of no short way of dealing with the cut-

worm. It is possible that the piercing of the ground with a crow bar, in two, three, or half a dozen places, near the plant, might entrap some of them ; and though laborious, this process might, in some extreme cases, where these worms are very numerous, be worth resorting to, inasmuch as it would, in some degree operate as a preventive of mischief, while the cultivator sleeps, or is absent for other reasons. If the depredator falls into the hole, he will be pretty sure to be hindered awhile from his mischief, and if the cultivator drops his bar into same holes, at his next round, the hindrance would become permanent. But we doubt whether there is any way less laborious, than to crush them under the heel, or more than half as sure. Some would say, instead of using the heel, use a stick of wood, say six feet long, an inch and a half through at the lower end, and enlarging slightly upwards, on the ground that this, brought down heavily upon the depredator, would not only put a stop to his mischief, but, when withdrawn, would leave a trap for his fellows. Where the cut-worms are very numerous and destructive, we think the suggestion may be worth heeding, as the killing of each worm would virtually be the setting of a trap for more.

Plowing late in the fall, and then again early in the spring, tends much to diminish these pests ; but it cannot be relied upon to kill them all ; the survivors must be met promptly and annihilated ; or a full crop of tobacco, uniform in the time of ripening, and all of a superior quality, cannot be expected.

Replanting in the spaces should be attended to promptly, but it cannot wholly repair the mischief, as the replanted hills will rarely show precisely the same forwardness as the first planted.

For a description of the horn, green, or tobacco worm as well as for other sound views on the general culture, we here copy from the *Country Gentleman*, a letter from John C. Roberts, of Tariffville, Conn.:

"Messrs. Editors—As my communication on the culture of tobacco, was so favorally received, I thought I might venture to write again. We have had a very large amount of wet, cold weather this spring. On the 12th (of June, 1859) we have a severe frost, which killed corn, potatoes, beans, and other garden vegetables to a great extent, though it did no injury to the tobacco. We are just setting out the tobacco plants, 5,500 or 6,000 to the acre, but the cut-worm keeps us busy; we have to go over the lot every day, early in the morning; and we find 200 or 300 worms to the acre. Is there no remedy for the ravages of these pests? We have tried every thing we know of, but have not found any thing to answer the purpose, but the thumb and finger.

"When the tobacco is set previous to the 15th of June, the cut-worm works at it more than when set later. Some of the best tobacco we had last year, was set on July 5th. After the cut-worm leaves, the green-worm appears. You will find the eggs from which they are produced on the under side of the leaf; they are a pea-green color and the size of the head of a large pin. The worm grows so rapidly that they are from three to four inches long in a week, if not sooner destroyed. They require close watching, for they will frequently destroy a large plant in a single night. The insect which lays the egg is a large moth, about two inches in length; when the wings are spread, they measure from tip to tip from three to five inches. They fly mostly at night, and hence are rarely caught; they are a brownish color, with a head very much like an owl.

"I have seen an elaborate description of the curing process at the South by fire, &c., but we take no such trouble here. When the plants are hung on poles, we see that they are not too thick, as, if they are, they

pole-sweat, which is the same as rot. All we have to do from the time the tobacco is hung up, until it is ready to strip, is to keep a current of air circulating through it, till it is cured, which is about three months. When cured, we watch the first opportunity, when the weather is damp and rainy, to open all air-holes to let in the damp air ; for the leaves get so dry that they break very badly without they are dampened.

"In shipping, all the first quality goes by itself, then second quality, and lastly fillers, which consists of rubbish of all sorts. A smart man will earn from $1.50 to $2 a day in stripping. But enough of tobacco, though if I can enlighten any one, by answering questions on the subject, I am willing to do so.

"JOHN C. ROBERTS,
"Tariffville, Conn."

VII.—HARVESTING AND CURING.

As regards the time, two things are to be considered: 1st. At what stage is the crop most valuable, provided it can be harvested at the moment? and 2d. To what extent should a consideration of time required to secure the whole crop, and of the dangers which thicken around it just before harvest, induce the tobacco-grower to commence operations a little in advance of the stage, which, in the abstract, seems best? The question is not, When is the crop exactly in the best state, for cutting? for it cannot always be cut the very day one would prefer ; but, When is it best, all things considered, *to commence* cutting ?

Mr. Geddes' view of this question is, that, when the topping is done, which is to be as soon as the blossoms appear, then break off all the suckers, and persecute to

the death all worms that show themselves ; at the end of a week, repeat the operation, at the end of another week, repeat it again ; and he adds : "By this time the crop is ready to *begin* the harvest." We conclude that the plant has not, in his opinion, then arrived at its very best state ; but that, in consideration of its perils and of the time required to secure the crop, he would then "begin," lest more should be lost than gained by delay.

Mr. Minor, late a distinguished farmer of Albemarle County, Va., remarks on the same point as follows :

"We have now arrived at the most difficult and critical stages of the whole process; every operation, from this time until the plant is cured, requiring great attention and care, as well as skill and nicety of judgment in the execution. And hence a great contrariety of practice in some of the minutiæ prevails, according to the superior skill and ability of different planters.

"It is difficult to convey an idea of ripe tobacco by description. It can only be learned by observation and experience. In general, its maturity is indicated by the top leaves of the plant turning down and often touching the ground, becoming curdled with yellow spots interspersed on their surface, looking glossy and shining, with an entire loss of fur, a manifest increase of thickness in the substance of the leaves, which, when pinched in a fold between the finger and thumb, will crack or split with ease. But the most experienced planters acknowledge that they are more apt to err in cutting their tobacco too soon, than in deferring it too long. As a proof of this, take two plants growing side by side, of equal size and appearance in every respect, and both apparently ripe ; cut one and weigh it both green and when cured; let the other stand a week longer, and when weighed like the first, the difference in favor of the latter will be astonishing.

"If it be asked, why we do not avail ourselves of he advantage to be derived from thus deferring the

operation; it may be answered, as I have before observed, that tobacco, while standing, is liable to be injured and destroyed by more accidents than any other plant, such as hail-storms, heavy rains, high winds, the depredations of worms, the growth of suckers from the root, which abstract greatly from the weight and thickness of the leaves if suffered to grow, and which it is not always convenient to pull off. Besides this, the season of cutting tobacco is a very busy one to the planter, and too much work would accumulate on his hands by deferring it to the last moment.

"For these reasons it is considered most prudent to cull out the plants as soon as they will make good tobacco, in which case the loss in the aggregate amount of crop is balanced by avoiding the risk of accidents, and being able to bestow more care and attention to what remains."

The following, from the same pen, gives a lucid description of the Virginia mode of cutting and curing tobacco:

"The cutters go over the ground by rows, each taking two at a time, and the plants they cut are laid in the intermediate row between them. This facilitates the picking up, as the cutting of four rows is thereby placed in one. The stalk of the plant is first split to within about six inches of the ground, and after being cut off just below the bottom leaf, is inverted and laid upon the ground, to fall and become pliant for handling. The splitting of the stalk is important, both for the convenience of hanging it on sticks, and accelerating the cure of the plant. To those unused to the culture and management of tobacco, it will be almost incredible to learn how soon it will *sun-burn*, as we call it, after being cut and turned over on the ground. This is effected by the hot rays of the sun piercing and penetrating the tender parts of the leaves, and is manifested by the parts affected turning white, and soon becoming dry and crisp, and, when cured, of a dark green

color, without possessing any of the strength or qualities of tobacco.

"In very dry, hot weather, sun-burning often takes place before a large plant falls sufficiently to be handled without breaking off the leaves; and for this reason the cutting in such weather should always be made early in the morning, and not proceed after ten o'clock. Sometimes it is done in the evening, when there is no prospect of rain, by which the packing up may be accomplished earlier the next morning, and with less risk of burning. As soon as the plants fall sufficiently to handle without breaking off the leaves, they are *hand-fulled*, as we call it; that is, they are picked up, and three, or four, or five plants are laid together, with their tails from the sun, and the stalks inclined and somewhat elevated against the sides of some of the hills.

"The pickers-up, after going through this ground, return and turn over each handful, that both sides of the plants may receive the benefit of the sun, and not be burnt; and this operation is again repeated, if by this time the tobacco is not pliant enough to be put in *shocks*. This is putting an indefinite number of handfuls together, the stalks in an erect position, forming a sort of circle of any diameter, from two to six feet or more, at convenient distances in the field; and these shocks should be immediately and effectually covered with green bushes, or something else, previously in place, for the purpose of excluding the rays of the sun.

"The next operation (after the heat of the sun has declined) is to remove the tobacco to the house or scaffold, and hanging the plants on sticks four and a half feet long, and about one inch square. The common pine affords the best timber for this purpose, which will rive straight and with ease. From ten to twelve plants, according to size, may be hung on each stick, the width of two fingers to be left between each plant. The scaffolds are raised four or five feet from the ground, and the poles to receive the sticks are placed four feet apart, and are made to range east and west, so that the sticks will be north and south, to give both sides an equal benefit from the sun.

"The tobacco is commonly removed from the field to the house or scaffold upon the shoulders of the laborers, carefully put on and taken off to avoid bruising; but if the distance is great, carts are used, greater care being necessary to avoid bruising. This is considered so important, that some judicious planters make temporary scaffolds in the field, preferring the risk of injury from a smart rain to that of bruising, by moving it far in a green state.

"There are two modes of curing tobacco: one in the house, altogether by fire; the other by the sun on scaffolds. The first is esteemed the best and most effectual, but it is attended with great risk. Our houses are generally four-sided pens, twenty feet square, built of round poles, and about twelve feet pitch. The joists are placed four feet apart, the rafters immediately over them having beams corresponding with the joists, three feet perpendicular from each other, so as to afford ranges or tiers for the tobacco up to the crown; and the same tiers are fixed below the joists and at the same distance, by extending poles across the house, between the logs of the pen. The house is covered tightly with pine boards; and, if it is intended to cure by fire, the openings between the logs should be closed to prevent the escape of heat. Such a sized house will cure from two to three thousand weight, according to the quality of the tobacco.

"If it be decided to cure by fire, the tobacco is carried immediately from the field to the house, hung on sticks as before described, and these sticks crowded as close together on the tiers as they can possibly be, so as to exclude all air from the tobacco. It remains in this situation until the leaves of the plants become yellow, or of the color of hickory leaves just before they fall. This will generally happen in four or five days, when the sticks must be spread and placed at their proper distances apart in the house. About six or seven inches is the proper distance, or any other that will prevent the plants on different sticks touching each other. A moderate heat, which is gradually increased to a very

strong one, is then applied, by making different ranges of fires throughout the house, and that wood is preferred and sought for which will make the greatest heat with the least blaze and smoke. The fires must be continually kept up until the curing is effected (say from four to six days), when not only the leaves, but the whole stalk becomes dry, and changes from a green or yellow to a light brown color.

"If it is not to be cured by fire, the tobacco is brought to the scaffold and hung, and the sticks are crowded in the same way on the scaffold, until the same yellow color is imparted to the leaves; and some planters are so particular as to cover their scaffolds with green bushes during this crowded state, to prevent sun-burning. When the proper time arrives, which is indicated by the yellow color of the leaves, the sticks are thinned and placed at such a distance as to admit the influence of the sun and air; and if the weather is warm and fair, in five or six days the curing will be so far effected as to justify the removal of the tobacco into the house, when it must be properly and finally arranged, and the cure will be gradually accomplished by time and season.

"But if damp, hot weather surpervenes, it will be necessary, both in this and in the case of tobacco already cured by fire, to make moderate fires under each whenever it comes in very high order. In such weather and in such order, tobacco is liable to contract a mould about the stems, which can only be prevented by keeping it dry by fires. This mould injures both the quality and appearance greatly, and cannot be easily rubbed off. Great attention is therefore necessary to prevent it by these occasional firings, until regular cool weather sets in, after which there is no danger. From the vicissitudes of our climate for some years past, and other causes, it happens commonly that some portion of our tobacco is not mature, and is left until we are compelled to cut it by the approach of frost. Such plants, even if fully ripe, seldom cure of a good color or quality, for want of proper seasons.

"And here we may venture a general remark, which

is, that tobacco cut early and fully ripe, will cure well and be of good quality under the most unfavorable circumstances, while that which comes late into the house is difficult to cure and of inferior grade. After the housing of tobacco is all accomplished, and the cool weather begins, the house should be closed with green bushes, or fence-rails set up on end close around on the outside of the house, to exclude damp air and beating rains, which generate mould, &c."

We now quote from Judge Beatty, of Kentucky, on *Southern Agriculture*. Our object is, to give the reader a distinct account of the processes most approved in that State, by the pen of a Kentuckian. Judge Beatty says :

"Tobacco must be split while standing ; and such hands as can readily distinguish between the ripe and green plants, should be employed in the splitting process. The most convenient knife for splitting tobacco is in form, somewhat like a broad chisel, except that the blade should be very thin. It should be three and a half inches wide, and of the same length, having attached to it a thin spear or shank, to be inserted in a handle about a foot long, having a cross-piece on the top, to be held by the hand. After the spear is inserted in the handle, the latter should be shaved flat on two sides, to prevent the end of the handle next the spear from striking against the top of the tobacco-stalk as the knife is run down. With this instrument a skillful operator can split the standing plants with great rapidity. They should not be split nearer to the ground than six inches.

"The cutter may follow immediately after the splitter, or at any convenient time afterwards. A common hemp-hook is the best instrument for cutting tobacco. The cutting-season is a critical time for the tobacco-crop. It is subject to a variety of casualties; and without particular care, is liable to sustain great and irreparable injury. It is subject to be *bruised* in handling,

to be *sun-burned*, and to be greatly injured by *heating* if suffered to lie too long in large heaps. Each of these will most materially injure the crop, and they must all be guarded against with utmost vigilance. The first is the most difficult to be guarded against, when tobacco is cut in very warm weather.

"After it is cut, it *must* lie long enough to fall or *wilt*, so as to become sufficiently pliant to handle without *breaking* or *bruising* the leaves. The hotter the weather the more difficult it is to accomplish this object without exposing the plants to the deteriorating effects of being *sun-burned*. It is surprising how quickly this takes place, when tobacco is exposed to the meridian rays of the sun, in the month of August, or early in September. The parts of the leaves which are *sun-burned* turn white and soon become dry and crisp; and when cured, assume a green color. The parts thus affected are completely ruined, having lost all the qualities of good tobacco. To guard against this casualty, when tobacco is cut early in the season, the operation should be performed in the morning, or so late in the evening, that the sun will not have power enough to injure it. Cutting, both in the morning and evening, may be practiced as convenience may dictate, and may be managed as follows: The planter may commence cutting in the morning, taking care to cut only so much as he can secure before the sun has acquired sufficient power to injure it.

"When the cutting is completed and the plants have fallen sufficiently, he should commence piling it in heaps with the butts towards the sun, taking care to handle the plants gently, holding them by the butts, and avoiding any pressure upon the leaves. By handling them thus, and laying them as lightly as possible in heaps, this process may be performed before the tobacco has completely fallen. The heaping should alway commence with the plants first cut, so that they may, as nearly as practicable, be exposed to the sun's rays an equal portion of time, or in equal degree, and should so progress till the whole is heaped. The stems of the tobacco are

the last parts that *wilt*. Being large and ridged, these require more sun to make them fall, and hence the necessity of placing the butts towards the sun when heaping tobacco. Being thus placed, the stems continue to be affected by the sun, while the plants are lying in heaps.

"The heaping of tobacco in some degree protects it from being *sun-burned*, but the uncovered leaves are, of course, unprotected. Hence the necessity of hauling the tobacco to the place of hanging it as soon as possible, after it has fallen sufficiently to admit of this being done without bruising or breaking off the leaves. Sleds are the most convenient vehicles for transporting tobacco to the scaffold or house where it is to be hung, if near at hand. These should have smooth plank on the bottom, to prevent the leaves of the tobacco from being torn or bruised. There should be no standards in the sleds, and the tobacco should be laid on in two courses, the tails lapped and butts out on each side. When unloaded, the butts should all lie towards the sun, unless the hanging is performed in the shade of a house or trees. These precautions are all for the purpose of preventing the tobacco from being sun-burned. If the cutting take place late in the season, or when the weather is cool, they will not be necessary.

"Planters who are largely engaged in the culture of tobacco, will be under the necessity of raising it at a considerable distance from the place of housing it. In that case sleds will not be convenient for transporting it, and it would be a much better plan to have a wagon coupled so as to hold a very long body, and sufficiently high to hang the tobacco, after being put on sticks, across the body. The sticks should be filled with the appropriate number of plants, in the field where it grew, and put at once into the wagon, pressing them as close together as possible without bruising the leaves. This will protect the plants from becoming sun-burned, and when the wagon arrives at the place of housing it, the tobacco may, at once, be transferred to the place where it is to be cured. It would be most convenient

to have two wagons, so that one may be filled in the field, while the other is hauling and discharging its load, and returning. So, also, if there be hands enough, the smaller ones may be heaping the tobacco, while others are engaged in putting it on sticks, and conveying it to the place of housing it. If the tobacco-house be so constructed as to admit the wagons to pass through the centre, additional facilities will be furnished for transferring the tobacco to the place where it is to be cured.

"Tobacco plants may be split, during the heat of the day, without injury. It is only liable to be *sun-burned* after it is cut. And hence the splitting process may progress, while part of the hands are engaged in hanging that which was cut in the morning. When the afternoon has so far progressed that tobacco may safely be cut without the risk of sun-burning (which is usually about four o'clock in August, and somewhat earlier in September), the cutting process should commence, and be completed as soon as possible, so as to give time for the plants to fall sufficiently to be handled the same evening, or the next day, before the sun has attained sufficient power to injure them. The first cutting of the afternoon, in the early part of the season, can usually be hauled and hung the same evening. That part of it which has not fallen sufficiently to be handled without bruising or breaking, should be suffered to lie in the field, without heaping, till the next day.

"It is usual, when there is not time to hang all the tobacco, during the same evening it is cut, to let a part of it lie over till morning, to be hung while the dew is drying off that in the field. This may be done to advantage if hauled on sleds, provided care be taken to prevent it from heating during the night. If suffered to lie in large heaps, it will be greatly injured in the course of one night. To guard against this casualty, it should be spread in long rows not more than three or four plants deep, when the weather is very warm. In cool weather the danger of heating is not so great. A little experience will teach the tobacco-planter to guard

against the casualty of which I have been speaking. It is very important that this should be done, as it is completely ruinous to so much of the tobacco as may become heated to a high degree, as it will be if suffered to lie in large heaps over night.

"There are two modes of treating tobacco when it is cut, one is to hang it on scaffolds, exposed to the weather; the other is to hang it at once in suitable houses.

"The former method must, of necessity, be resorted to where there is a scarcity of house room. By hanging some time on a scaffold, the tobacco commences curing and can be stowed much closer in houses than it can be, with safety, when first cut. But it is subject to serious disadvantages. Those parts which are exposed to the sun are liable to be sun-burned, and much of it may, therefore, be injured on the scaffold. Another injury, and a most material one, is, that if suffered to remain on the scaffold till the leaves begin to cure, they are liable to be injured by the dews which fall every night; and still more by a rain, if one should happen to fall. If the tobacco is *housed*, from the scaffold, before it begins to cure, not much is gained in point of room, when stowed in the tobacco-house. If suffered to hang on the scaffold till partly cured, it may be greatly injured by rains and dews.

"The safest way, therefore, is to put it in houses or under sheds, as soon as it is cut. But here again care must be taken to avoid another casualty, that of being *house-burned*. It is stated in the *Farmer's Guide*, page 265, that, if it is intended 'to cure by fire, the tobacco is carried immediately from the field to the house, hung on sticks, as before described, and these sticks crowded as close together on the tier as they can possibly be, so as to exclude all air from the tobacco. It remains in this situation until the leaves of the plants become yellow, or of the color of hickory leaves just before they fall. This will generally happen in four or five days, when the sticks must be spread and placed at the proper distances in the house.' There never was a greater

error than that contained in the above extract. Tobacco thus housed, would be completely ruined long before the five days should have elapsed. If intended to be cured without fire, the house should be as open as possible, for the free admission of air. The sticks on which the tobacco is hung should be placed from eight to twelve inches apart, according to the size of the tobacco, so that the air could circulate freely between the ranges of sticks. It should be continued in this open order until the tobacco is partially cured, when it may be rehung in much closer order, so as to make room for the later cutting. If hung in open sheds, with tight roofs, so much the better, so that the rain is prevented from beating in on the tobacco, which may be done by setting up fence rails or rough plank against the open sides of the shed.

"If intended to be cured by fire, the house should be rendered as tight as possible, in all parts, except the roof, through which the smoke must escape. But instead of being crowded together, as recommended in the extract given above, it should have space enough to prevent the plants on the different sticks from *pressing hard* against each other, after the tobacco has completely fallen. Instead of suffering the tobacco to hang four or five days before fire is put under it, the house should be filled *as soon as possible*, and fire put under it *immediately*, to prevent the danger of house-burning.

"For the first few days the fire should be moderate, till the *edges* of the leaves turn of a yellow collor. The fires should then be gradually raised and the house kept sufficiently warm to cure the tobacco in a few days. In making kite-foot tobacco, the rule is, I believe, that the tobacco, stalk and all, must be cured in forty-eight hours from the time the fires are *raised*, which, as I have already remarked, must be when the leaves *begin* to turn yellow arcund their edges.

"After thus commencing to change color the entire leaf very soon assumes a beautiful yellow hue, and the object is to cure it before it turns to a nutmeg brown. If the curing is not *very speedy*, it will, or a great part

of it, change to the latter color before the operation is completed.

"The next thing to be done, after the tobacco is housed and cured, is *stripping*. This must be delayed till the *stem*, as well as the leaf, of the tobacco is thoroughly cured. Stripping can only be performed when tobacco is in such high *case* as to render the stems perfectly pliable, or at least such a portion of them as will supply a sufficient quantity of *tying leaves*, that is, leaves to tie the tobacco in *hands*. To perform this operation neatly, the stem of the leaf with which the hand is tied should be soft and pliant. As seasons for stripping are precarious, whenever tobacco, after being sufficiently cured, comes into case, a quantity for future stripping should be taken down, and packed in close bulk, with the tails in the centre and the butts of the stalks out. This bulk should be inclosed by the walls of the house on two or three sides, and plank on the other, and should be well stuffed all around between the inclosure and butts, with straw, so as to exclude the air. Thus packed away, tobacco will remain in *case* for a long time, but care must be taken not to pack it down when in too damp order, otherwise it will go through a heat, and be greatly injured, unless it be stripped out in the course of a few days.

"If put down in proper order, it may be stripped out at leisure, provided it is not packed in bulk before the weather has become cool, say November or December. When stripped and tied in hands it must be put in bulk, lapping the tails in the middle, and leaving the heads all on the outside of the bulk, so that they can become thoroughly dry. If not in too *high order* when put in bulk, as above directed, it may be suffered to remain till February, when it should be hung on sticks, the hands as close as they can be conveniently placed to each other, without pressing them together, and hung in the tobacco-house, leaving the sticks so far apart as to admit the air to circulate between them.

"In this situation the tobacco will become thoroughly dry in a few days. It must be left hanging until a rain

shall again bring it in *case*. It will be observed that the *leaf*, in contradistinction to the *stem*, will first come *in case*, whilst the stem will be found still dry and brittle. This is precisely the order in which tobacco should be, when it is to be finally bulked down for market or *prising* in hogsheads.

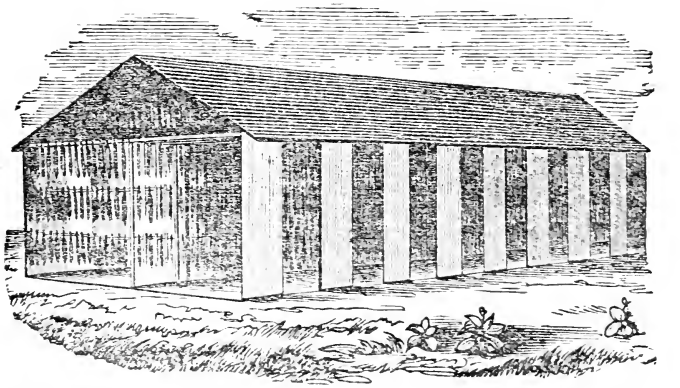
"It should now be put down in a very large bulk, which may include the planter's entire crop. The number of courses may be six, eight, or any larger number, and the whole should be inclosed by the walls of the house and plank, and closely surrounded and covered with soft straw, so as perfectly to exclude the air. In this condition it may be kept for any length of time, and will be ready at all times for hauling to market in the *hand* or *prising*. One precaution only will be necessary. When the cover of the bulk, is taken off for the purpose of taking out a part of the tobacco for prising or sale, the entire course or courses, on the top, should be taken off smoothly, and the cover carefully replaced. This is necessary to prevent the top of the bulk from becoming too dry. When *prising* in the summer, some elder bushes may be spread over the bulk, to keep the tobacco damp. Tobacco prepared as herein directed, may be kept any number of years in bulk, or may be transferred to hogsheads and kept for any length of time, not only without injury, but will constantly improve by age.

"It should be remarked, that to make tobacco of a very superior quality, great care should be taken when the stripping process is going on, to separate all the injured or defective leaves from the prime tobacco. To this end every plant should pass through the hands of a good judge of tobacco, who should *cull* out all the injured and defective leaves, which should be kept and sold separately."

The foregoing from the pens of two distinguished farmers, one of Virginia, and the other of Kentucky, exhibit fairly, we believe, the best practice of those great tobacco-growing States. We now turn to the

northern and eastern views of the same subject. That the North has borrowed its practice, with regard to the cutting and curing of tobacco, measurably, from the South, is highly probable. Has it improved upon the South? Or, are its innovations only so many adaptations to a different climate, and a different system of labor? We care not to decide which; and will only say, that we suppose practice on the James or Ohio River, and on the Northern Mohawk or Connecticut, may differ for the best of reasons, and that in neither case need the practice of one region operate as an impeachment to that of the other.

It will be recollected that Mr. Geddes, in his able report to the New York State Agricultural Society, puts the time for commencing the harvest, "When the suckers have all appeared down to the lower leaf, every sucker having been removed as it appeared," He says:



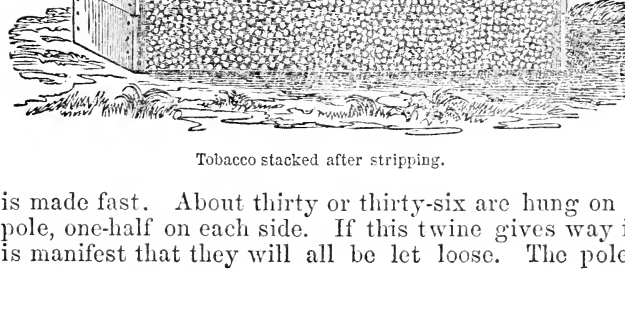
Tobacco-house without side-doors, end boarding, and end doors, to show the manner of hanging the Tobacco.

"The stalks are cut at the root. In a warm day, cut in the morning and evening. In the middle of a hot day

the leaves will burn before they are wilted. The best way is to cut in the afternoon and lay on the ground to wilt. This wilting forwards the process of curing, and so toughens the plant as to make it practicable to hang it without much loss in breaking leaves.

"After wilting draw to the house, which should be twenty-four feet wide, fifteen feet high, so as to have three tiers, one above the other. A building of this width and height, thirty-five feet long, will store an acre, or one ton of tobacco. The girts on the side of the building should be five feet apart; a row of posts through the middle is necessary to put girts in, to hold the poles that the plants are tied to. The best poles are made of basswood sawed one and a half by four inches, and twelve feet long.

"The plants are handed to a man who, standing on a movable platform made by a light plank, receives them, and beginning at the upper tier he winds a piece of prepared twine around a stalk, fastening the first plant to the pole; the second plant is placed on the other side of the pole, and a single turn is made around the stalk; then again the third stalk is put on the same side of the first, the twine passed around, and the next on the other side, and so on to the end of the pole, where the twine

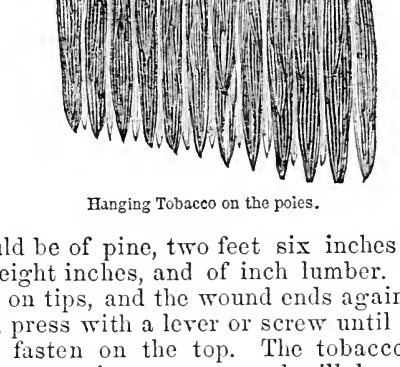


Tobacco stacked after stripping.

is made fast. About thirty or thirty-six are hung on a pole, one-half on each side. If this twine gives way it is manifest that they will all be let loose. The poles

are put on the girts about fourteen inches apart. In this way the whole building is filled. Skill is now demanded to regulate the ventilation until the crop is cured, which is determined by examining the stem in the leaf, which should be hard, up to the main stalk. Then in damp weather the tobacco can be taken down and laid in piles, with the tips together to keep it from drying, and to secure this, cover over with boards.

"The next thing is the removal of the leaves from the stalks, taking this time to separate the broken leaves from the unbroken ones. They are then made into parcels of sixteen or eighteen, called 'hands,' and are fastened by winding a leaf around them. Pile these hands tips on tips, the square ends out. This preserves the moisture. The pile should be kept covered with boards, and the sides also covered, leaving the wound ends of hands exposed to the air. If everything up to this point has been skillfully done, in four or five days the tobacco will be fit to pack in cases, and taken to market. The



Hanging Tobacco on the poles.

cases should be of pine, two feet six inches square, by three feet eight inches, and of inch lumber. Place the hands tips on tips, and the wound ends against the ends of the box, press with a lever or screw until 400 pounds is in, then fasten on the top. The tobacco now goes through the sweating process, and will lose about ten per cent. in weight before fit for use. This tobacco is

known in the market as 'seed-leaf,' and is principally used for wrappers for cigars; the refuse is exported. A crop handled in the manner, described, and with skill, will sell in New York City, at from 12 to 15 cents a pound; but from want of proper care and skill, the crop of this county does not bring an average price of over eight cents.

COST OF CROP.

The plants are worth per acre	$2 50
Manure, 10 cords, say	20 00
Fitting ground and marking	4 50
Planting and setting	5 00
Cultivating and first hoeing	2 00
do. do. second hoeing	1 50
Topping, and killing worms, say	1 00
Suckering, first and second times	2 00
do. third time	4 00
Harvesting and hanging (four men and team one day),	6 00
Stripping one ton	10 00
Five packing-boxes	5 00
Labor of packing	1 50
Twine for hanging	1 00
	$66 00

"A ton at 13½ cents, is worth $270; deduct 10 per cent. for shrinkage, and 1¼ cents per pound for transportation and commissions, in all $52, leaves $218 as a net proceeds. The cost being taken from this, $66, and we have $152 for the use of lands and buildings.

"This is the best statement that can be fairly made for this crop. If the price be put at the average our growers get, viz., 8 cents per pound, we have for the crop, 1,800 pounds, after shrinking, $144. Deduct $66 for cost, and $22.50 for commissions and transportation, in all $88.50, which deducted from the amount received, leaves $55.50 as the ordinary profit per acre.

Jonathan Periam, in the *Prairie Farmer*, for January 24, 1863, says :

"The plants being cut and wilted, should be drawn

to the house, for drying ; 2 by 4 scantling of basswood or pine, are suitable for hanging on, though smooth rails are often used, but are not economical, according to the plan herein described. The plants are handed to a man, who, beginning at the top tier of the house, proceeds to tie them as follows :

"Have a piece of twine upon a needle, similar to a seine needle. After tying the first stalk to the pole, he places another on the opposite side of the pole, and takes a single turn around the stalk. The third stalk is then placed upon the same side as the first, the twine passed around the fourth on the other side, and so on, until the pole is full, and the twine made fast. The twine should be strong enough to support the strain, for if it breaks, the whole string of tobacco will fall. The manner of drying it may be seen in cut 9.

"One plant should not touch another, as it would cause them to mould. After the first pole is filled, another may be operated upon, until the whole range is full. Then commence with the second tier, and so on, until the house is filled, or the crop secured. Care must now be taken to regulate the *ventilation* until the crop is cured, which is not completed until the stem in the leaf has become hard, clear up to the main stalk. A tobacco house may be twenty feet high, thirty-six feet wide, and forty feet long. This will give three ranges, twelve feet wide, and four tiers in height, and will hold from two to two and a-half acres of heavy tobacco. It should have doors in the ends and sides, extending to the eaves, to insure thorough ventilation, but care should be taken that strong winds do not blow the tobacco against each other, especially when dry, as it is thereby broken and injured. In order to insure thorough ventilation in a building of this size, it should have a ventilator on the top running the whole length of the building, similar to those on breweries, which may be closed by means of blinds. Where but little tobacco is raised, it may be hung in the loft of the barn, and other out-buildings, and in this way from one-half to one acre may be easly disposed of. After the tobacco is thoroughly cured, a damp

day should be selected for taking it down. Lay it in piles with the tops overlapping each other, and the butts outwards, and cover with cloths, boards, or straw, to keep it from drying, then remove the leaves from the stocks by breaking them at the junction thereof, separating them into three sorts, viz.: The best and most perfect leaves for wrappers, the broken and smaller ones for seconds, and the inferior and green for thirds, doing each kind into hands of twenty to twenty-five leaves, by putting the butts of the leaves together and winding a leaf around, passing the end under a portion of the hand, and again pressing them together. It should be remembered that after the tobacco is cured on the poles that it may hang indefinitely without injury, in fact, it increases in quality with age, therefore no hurry need be used in tying in and sweating (unless the grower wants to realize on his crop) until the following spring."

By the same writer last quoted, we take the following on the further preparation of the leaves for market, from the *Prairie Farmer*, for January 31, 1863. He says:

"The leaves having been made into hands, as directed, proceed to lay them in a frame, by placing them tips on tips, with the round ends outward. The top should he covered with boards or cloths to preserve the moisture; at the end of two days examine, and if heating or showing inclination to mould, place into another frame. If the sweating goes on well, it will be perfected in from four to six days. It is then ready to pack in cases and take to market. Cases should be of inch lumber, three feet and eight inches by two feet six inches square. Four hundred pounds should be put in a case, place them in, the butts against the box, and the tips overlapping each other, press with a screw or lever, and fasten down the top. With old tobacco growers, no difficulty is experienced, but beginners should watch each process carefully; therefore, before packing finally, one box should be packed and examined after a time, and if it does not mould, the whole should

be packed. When packed in cases, it should be just moist enough to pack without danger of breaking. When moist it is like a thin kid glove ; when dry, like tinder.

"After being packed in cases, it will go through another sweating process, and lose from eight to twelve per cent. in weight, and improve in quality by keeping. Pack wrappers, which are the best leaves, in cases by themselves, and so with seconds and thirds. Wrappers are used for the outside covering of cigars ; the seconds and thirds for binders and fillers.

" With a simple recapitulation of prominent points, I will now leave the subject. I advise no one to go into the cultivation of tobacco extensively, at first, unless acquainted with the business. Still, almost any one having suitable land, may cure one half, to one acre, without permanent buildings. Tobacco wants a warm, rich soil, protected from winds, good cultivation, and careful watching.

" Plant seed, 1st of April ; transplant into field May 20th to June 10th ; middle of July to September 1st, top, sucker, and hunt worms. No crop pays better for frequent stirring of the soil. If but little is planted, the hills may be made with a hoe. It is better to have the ground fitted a little time before setting ; if so, scrape off the hills with a hoe before setting. Reset as fast as killed by worms. It is a good plan to plow in the fall to kill out worms, as well for other crops as for tobacco. The worms which feed upon the mature leaves are the larvæ of the *Sphinx Carolina*, color green, transversely wrinkled, with oblique white lines on each side, and a reddish caudal horn, exceedingly voracious, sometimes ruining tomato as well as tobacco crops in a short time, if not disturbed. These undergo their transformation so deep under ground that the plow does not often reach them. Top when the terminal bud appears—leave from nine to fifteen leaves. The distance for planting in these articles, is for very rich ground ; the poorer the soil, the farther apart must the plants be. Every sucker left takes just so much from the value of the crop.

"Do not let the crop get wet after cutting; do not expose it to a hot sun. Both are equally injurious. It is fit to cut when it assumes a mottled appearance, the veins become sunken, the leaf breaks with a clear fracture, and it is thicker in texture than before. After cutting, handle always by the butts. The peculiar color is given in a measure by sweating. It should be some one of the shades of cinnamon. Skill in the art can only be acquired by practice. Trust none but careful men with the handling of tobacco. Do not let the plants touch each other in the drying-house, and let the roof be rain-proof, and be sure, above all things, to get good seed of some reliable man, and do not grow it on a rank, coarse soil. It will pay to take care of the crop at thirty cents per pound."

It will be noticed that northern cultivators say nothing of splitting down the stem, but instead of this splitting, in order better to hang the plant in the drying-house, they generally, we believe, if not unanimously, prefer the use of twine for suspending the plants to dry. With regard to the fire drying, so much spoken of by southern cultivators, we believe it is seldom or never resorted to by northern cultivators.

VIII.—DISEASES, ENEMIES, CASUALTIES, EXHAUSTING TENDENCIES.

On these we give the results of long experience, by the late Peter Minor, of Albemarle County, Va. Mr. Minor concludes his treatise, in the following words:

"Tobacco is subject to some diseases, and liable to be injured by more casualties and accidents than any other crop. That growing upon new or fresh high land is

seldom injured by any other disease than the *spot* or *firing*, which is the effect of very moist, succeeded by very hot weather. For this we know of no remedy or antidote. Tobacco growing upon old land, particularly upon low flats, besides being more subject to spot, is liable to a disease we call the *hollow stalk*, which is an entire decay and rottenness of the inside or pith, terminating gradually in the decay, and final dropping off of the leaves. This disease is sometimes produced by the wounds caused by pulling off overgrown suckers, thereby admitting too great an absorption of water into the stalk through the wound.

"In land not completely drained, the plants are sometimes apt to take a diminutive growth, sending forth numerous long, narrow leaves, very thickly set on the stalk. This is called *walloon* tobacco, and is good for nothing. As there is no cure for these diseases when they exist, we can only attend to their prevention. This, will at once be pointed out by a knowledge of the cause, which is too much wet, and indicates the necessity of complete and thorough draining before the crop is planted. It may not be amiss here to mention, that tobacco is more injured than any other crop by plowing or hoeing the ground when it is too wet, and to express a general caution on that head.

"The accidents by which tobacco is often injured and destroyed, are high winds, heavy beating rains, hail-storms, and two kinds of worm, the ground or cut-worm, and the large green horn-worm. High winds, besides breaking off the leaves and thereby occasioning a great loss, are apt to turn them over. The plant, unlike most others, possesses no power to restore the leaves to their proper position, which must shortly and carefully be done by hand, otherwise the part inverted will gradually perish and moulder away. Those who have studied the anatomy of plants can tell us the cause of this, as well as why nature has denied to tobacco the faculty of restoring its leaves to their proper position.

"The ground-worm, the same which is sometimes so fatal to corn, is ascertained to be the larvæ of the com-

mon black bug found in great numbers under wheat shocks, &c. This worm is seldom or never found in new land, but abounds in old or manured ground; and in some years I have seen them so numerous, as to have from forty to fifty taken out of one hill in a morning. The alternatives are either to abandon the crop, or to go over the ground every morning, when they can be found at or near the surface, and destroy them. The missing hills to be regularly replanted.

"The horn-worm is produced from a large, clumsy, gray-colored fly, commonly seen late in the evening sucking the flowers of the *Stramonium* or *Thorn-apple*, or commonly called here the *Jamestown weed*. The flies deposit their eggs in the night on the tobacco, and all other narcotic plants indiscriminately, as Irish potatoes, tomatoes, &c. In twenty-four or thirty-six hours the eggs hatch a small worm, which immediately begins to feed on the leaf, and grows rapidly. Great care should be taken to destroy them while young. Turkeys and Guinea fowls are great auxiliaries in this business, but the evil might be greatly lessened if the *flies* where destroyed, which can easily be done in the night by a person walking over the ground with a torch and a light paddle. They will approach the light and can easily be killed. In this way I have known a hundred killed in one field in the course of an hour.

"Tobacco has been reproached as the cause of the general exhausted condition of our lands, of the slow-paced improvement in the Virginia system of agriculture; in short, as the bane of all good husbandry. The stigma is, I am persuaded, in a great measure unmerited. It is true, that, like Indian corn, from the frequent and high degree of tillage it requires throughout the summer, it exposes the ground to be washed by hard rains, and evaporated by the hot sun; but the plant in itself is less an exhauster than corn or wheat. A proof of this is to be found in the superior growth and perfection to which any crop will arrive when grown after tobacco, than after anything else, not excepting clover that has been plowed in. Perhaps this may be accounted for from the

facts, 1st. That the roots and stubble of tobacco left on the ground are more in quantity, and contain more of the essential qualities of manure, than those of any other plant; 2d. The plant itself, while growing, feeds more from the atmosphere than any other; and 3d. It is not suffered to go to seed, the process in all vegetation which is supposed to make the greatest draft on the fertility of the earth. Neither is the culture of tobacco incompatible with a proper rotation of crops, and an improved system of husbandry, for we find as extensive and as successful efforts at improvement made in the tobacco region, and by tobacco makers, as in any section of our State."

With regard to the exhaustion of land by tobacco, let us look with an eye of common sense at the matter. Suppose you clear a piece of woodland, and take off 1,200 lbs. of tobacco the first year; 1,000 the second; 800 the third; 650 the fourth; and 500 the fifth, all without manuring. Has it not been a process of taking something every year, and adding nothing? Of course, the land is exhausted. Who cannot see that it would be, just as plainly as he could see the uncovered bottom of a purse, out of which something had been taken daily, and nothing returned, till it was entirely empty?

But let us change the supposition a little. We will suppose that, at the end of the first year, you had put on as much manure as would have made that land produce as much tobacco the second year as the first, say 50 lbs. of Peruvian guano, 200 lbs. of superphosphate of lime, and 10 loads of compost, half from the barn-yard manure, and half from the muck swamp; and suppose, further, that you had continued such a course for the five years, keeping the land up to its original productiveness, 1,200 lbs. a year to the last. Is it not clear that the

land is not exhausted? If it produces as much of this crop at the last as at the first, it would assuredly produce as much of some other crop, and perhaps more. It stands as a certainty, then, that the land is as good as ever, or a little better for general cultivation.

But let us change the supposition again. Suppose you had put on that land 25 loads of barn manure, composted with swamp muck, 200 lbs. of Peruvian Guano, and 300 lbs. of superphosphate, after taking off the first crop of 1,200 lbs. and have got 1,600 lbs. for the second, and suppose you had continued the same manuring to the end of the five years, and had ended with crops of from 2,000 to 2,500 lbs. It is clear as sunbeams, that your land has been improving all the while, and that now, if you follow the tobacco with wheat, your chance will be good for 40 bushels an acre, and then as stout clover as can grow, for three years at least, with no other manure, than that applied for the last tobacco crops.

The Connecticut valley farmers, who apply a hundred dollars worth or more of manure to the acre, and then take off 2,500 lbs. of tobacco, understand perfectly that the land is not exhausted, but that more than half of the manure even remains in the soil for the benefit of the after-crops.

A five years' cropping with tobacco, according to the supposition just made, may not be a commendable way of farming. We do not so regard it. More changes are desirable. But such a course, unwise though it is, cannot exhaust land, if it is so cultivated and so manured as to prevent a falling off in the crops. The truth, and the whole truth, on the question of exhausting lands, and of keeping them good, or of making them better, is contained in the following three propositions. Using

the word cultivation to imply both the manuring of the soil, and the working of it, we say :

1. *Cultivation, with diminishing crops, exhausts the land* always, and no other cultivation does.
2. *Cultivation, with neither diminution nor increase of crops, just keeps the land good and no more.*
3. *Cultivation, with increase of crops, improves the land always*—makes it worth more to the owner, worth more to a purchaser, worth more to a lessee.

If we were going to lease a farm for ten years, if two, equally good ten years ago, were offered ; and if the out-going tenant from one had contrived to diminish his crops one-third, while the out-going tenant from the other had increased his in the same ratio, we would pay double for the latter that we would for the former.

The same rules hold good with regard to the cultivation of tobacco, as to general farming. The views of Mr. Minor, who was himself a practical and successful farmer, are undoubtedly correct. The very general idea, that tobacco is, *of course and necessarily*, an exhausting crop, has grown out of unskillful management. Tobacco may be made to exhaust land; and so may corn, wheat or any other crop.

IX.—MANURE REQUIRED.

Barn-yard manure will answer all purposes of farming No other would be necessary, if any prescription could be found whereby the farmer could obtain it in sufficient

quantities. The droppings of well-fed animals are all he needs, if so preserved as to retain all their original constituents, with no loss and no change of their relative proportions of soluble and insoluble matter; that is, if both the liquid and the solid portions, combined with a little dried clay, or charcoal dust, or dry swamp soil, be preserved with no deterioration till applied to the soil they afford all that plants require.

But as no one has yet been able to prescribe how they can be obtained in sufficient quantity, and as not one farmer in a thousand has yet learned to preserve them in full value, it is well to inquire, what other fertilizers are suited to tobacco? Guano is good for this crop beyond question. Superphosphate of lime is good. In soils pretty well supplied with barn manure, we think that superphosphate plays a more important part in making out the tobacco crop than guano. We would apply both, say from 1 to 2 cwt. of guano, and from 2 to 3 cwt. of phosphate, depending somewhat upon how much other manure is to be applied.

Our idea is, that barn manure, composted largely with leaf-mold, hedge-scrapings, swamp-muck, or something of the kind, should be used plentifully, and, then, to supply deficiencies in quantity with some of the more portable manures, as Peruvian guano, superphosphate, castor-bean pomace, butchers' scraps, etc., etc. With reference to the tobacco, as well as to the wheat, which is now pretty generally made to follow it, we would certainly apply more or less of both guano and of superphosphate, not mixed, but separate, because the guano requires to be covered deeply and diffused throughout the soil, while the superphosphate should be left on or very near the surface, the tendency of guano being to rise into the

air, that of superphosphate to dissolve and flow downwards.

The pomace made by the manufacturers of castor-oil from the castor-bean, is said to be excellent for tobacco. The scraps made by the tallow and lard triers have been sought of late years for the same purpose, the price being, we understand, about one cent a pound, or $20 a ton. If in any tolerable state of preservation, it might be good economy to first throw them to the pigs ; let them consume such portions as they would, and compost the rest with the contents of the pen, the whole to be applied to the tobacco crop. Something might be thus gained, in the way of food for the pigs, and the manurial value of the scraps somewhat enhanced. But the cultivator of tobacco may safely conclude that almost any thing which has been found favorable to general cultivation, will hardly fail to be favorable to this crop, and so may be guided very much by circumstances. The wastes from cities, villages, and manufactories may all be made to supply the wants of the farm ; and the grower of tobacco will, naturally, look around him, and see whence he can purchase, with the least expense for transportation.

Unleached wood-ashes, the spent ashes of soap-boilers, the refuse of alkali works, the flocks from woolen factories, poudrette, night-soil, the horn and bone dust from comb-makers, ground bones, almost any of the wastes offered for agricultural purposes, may be profitably used by cultivators near the places where they are produced and sold cheaply as wastes. Gas lime would be good, if spread on the ground the previous autumn and left exposed till the time for spring plowing ; and green sand marl would be profitable on most soils, so situated

that the transportation would be light. The latter is better adapted to sandy or slightly loamy soils ; but is good for any soils not already abounding in potash.

As tobacco requires much alkali, the soil should be supplied with this in the form of lime, potash, soda, and ammonia. All those are contained in well-preserved barn manure. Ammonia, as all know, abounds in Peruvian guano and in all barn manure not half spoiled by mismanagement. Lime may be most cheaply supplied from the gas-house, only it must not be applied in a fresh or hot state immediately before planting tobacco or any other crop. A small dressing of common salt, not more at one time than five or six bushels to the acre, will supply all the soda required. That a soil for tobacco should contain lime is important ; and the spent ashes from the soap boilers are perhaps, the next cheapest way of supplying it, after that before named—the waste lime from the gas-house.

In virgin soils, and in all limestone regions, that have not been long cultivated, it is safe to presume that there is lime enough already in the soil. But, in all other cases, the farmer cannot safely presume upon there being lime enough in his soil for a large crop of tobacco and then a large crop of wheat to follow, unless he has put it there ; and will do well to apply it in some form, as gas lime, leached ashes, or a pretty large dressing of the superphosphate.

Since writing the above the following facts have come to our knowledge : Some years ago, Joseph Harris, Esq., editor of the *Genesee Farmer*, published an essay on the phosphates, in which he stated, as probable (did not know by actual experiment, but thought) that superphosphates of lime, if tried, would be found to

hasten the germination of the seed and the growth of the young plant, and to effect an earlier maturity of the tobacco crop. He believed, also, that superphosphates would improve the quality of the leaf. This opinion of Mr. Harris has since been experimented upon by Mr. Lindsay, of West Meriden, Conn., and others, and the results have been such as to lead Mr. Harris, in a recent number of the *Genesee Farmer*, to write more confidently, as follows :

"We would use it in this way : First, after preparing the bed for the seed, scatter over it broadcast from 2 to 3 lbs. of superphosphate per square rod ; rake it in and sow the seed. It will not hurt the seed."

"The superphosphate will hasten the germination of the seed and the growth of the young plants. It will develop the fibrous roots of the plants, so that when they are pulled up there will be more soil adhering to them, and they can be transplanted with less uncertainty. In transplanting we would apply the superphosphate at the rate of 300 lbs. per acre, in the hills. It will not hurt the roots of the plant if put in the hole with them, but it will be better perhaps to mix the superphosphate a little more with the soil, though the great value of superphosphate consists in giving the plants an early start, and for this reason should be near the roots during the early growth of the plant."

From all we can learn of the experience of the most successful tobacco growers, we feel little hesitation in recommending superphosphate as among the best manures, if not the very best for this crop, both for the seed bed and the field.

X.—MULTUM IN PARVO.

The whole subject in few words.

BY H. BEARDSLEY, OF CONNECTICUT.

At our earnest solicitation, Mr. Beardslee, a successful tobacco grower of many years' experience, has furnished us the following. He was requested to either give us his experience in the way of a narrative, or to embody the same in the form of plain, simple directions. It will be seen that he has done better than we asked—he has combined the two modes of experiment and precept, and has made his instructions so plain, as we particularly requested him to do, that the beginner in tobacco culture need not err, even with no other instructions before him.

THE GROWING OF TOBACCO.

I prepare the seed bed as follows—spade in a large quantity of manure and wood-ashes. *Hog manure is the best*—about five or six inches deep, then rake into the top of the bed fine bone manure. It is then ready to sow.

The seed is prepared as follows: I mix one tablespoonful of seed for each square rod, to be sown with fine, rotten apple-tree wood, in a pan; this can be sown even when it is wet—to be placed in a warm room, near a a hot stove. I keep it moist, adding water as it becomes dry. In five or six days it is ready to sow. I now add to this some *plaster of Paris*, in order to see that it is sowed even.

Sow in a still day—rake the bed very light, not to exceed half an inch in depth, then roll with a garden roller or a smooth log about two feet long, and the bed is done. Beds to be three feet wide for the convenience

of watering and weeding. I water as soon as sown, and continue to water every day, *if necessary*, until I am through with setting. The time of sowing is from the first to the middle of April. Water applied from the well should be drawn and exposed to the sun twenty-four hours before used. Plants should be watered night and morning, *never while under a hot sun.*

The plants will generally appear about the first of May. The beds are to be weeded by hand as the weeds appear, and from the 10th to the 15th of June the plants will be ready for transplanting, the leaves being about three inches in length. One tablespoonful of seed will produce plants enough for one acre of tobacco, if they do well. I generally sow two or three times the quantity of land for plants that I expect to use, as the plants sometimes fail. Take the plants from the bed by means of some pointed instrument, leaving the smaller plants to grow as they are wanted.

The soil designed for a crop of tobacco should be rich, mellow, and recently manured, and should be kept free from weeds by frequent plowings, if necessary. I make small ridges about three feet distant, and set the plants about two and a half feet distant on the ridge, removing some of the soil to the furrow in order to set the plants about on a level, so that, the hoeing being finished, the field will have about a level surface, and the plants stand as they did in the bed. I make rows but one way; plow and hoe twice; plow with a horse —generally turn the soil from the plant the first time plowing, *using a small plow.*

In setting plants when the soil is rather dry, it is frequently necessary to water. I dig small holes, put into each hole about one pint of water, and in about

thirty minutes set the plants. If the weather should be warm, I cover the plants with a handful of fresh mown grass. This protects them sufficiently against the rays of the sun, retains the moisture about the plant, and at the same time gives it the benefit of the dews and rains. In about one week the grass can be removed. The water can be drawn and placed in tubs about the field, as is most convenient. The expense of watering is about $5 per acre, the expense of covering an acre about $1.50, and if the sun is bright and warm, it is economy to cover, if the soil is sufficiently moist of itself. By this means you will save most of your plants. The transplanting is finished about the 25th of June.

The next morning, after setting, I take a pan of plants, go over the field, reset all plants destroyed by the brown, or corn worm, as we call it, and continue to do this for several days. You can find him near the plant, just under the surface. He is to be destroyed to prevent further depredations. The plant is not injured unless the centre is eaten. I also set, in different parts of the field, substitutes between plants, to be removed immediately after a rain, after it is too late to reset. For these I *dig the hole*, and remove the substitute, with the soil, to the place designed, while the soil is wet. By this means every hill can be supplied.

From the 15th to the 20th of July the tobacco-worm will make its appearance, and can be detected by small holes in the leaf. He will be found on the under side, and is to be destroyed while small. You will find him an unwelcome visitor as long as your tobacco remains in the field. I worm tobacco three times in each week, at least. This requires some care. You can detect by the fresh work, as the holes have an old appearance very soon, by reason of the dews and rains.

I commence topping when the majority of the field is ready to bloom, breaking off the main stalk with five or six leaves, topping all plants, that they may ripen at the same time, taking a less number of leaves from the small plants.

In about 8 or 9 days, when the suckers are about 4 or 5 inches out, they are to be taken off, and in about 8 or 9 days sucker again, by which time, if a good growth, the tobacco will probably be ready to harvest. I cut the last of August or fore part of September. Tobacco should be suckered, and wormed the last thing before harvesting, as otherwise the suckers will give trouble while stripping, will grow on the poles, and injure the tobacco, and the worm will also commit his depredations.

I use a small saw for cutting. Cut close to the ground horizontally, with one stroke. Lay the plant carefully down to wilt. If tobacco is large, it will require turning; if small, it may require turning, as it will burn very soon under a hot sun, when wilted, and then it is worthless. Cut in the morning, wilt, and finish hauling before 11 o'clock, and then commence *hanging*, or in the afternoon, and haul when it is ready. Tobacco left in a pile over night would heat, and be worthless in the morning. It should be handled by the butt of the plant, not by taking hold round the leaves, always taking the plant from the top of the pile, to prevent injury. Plants are to be hung on poles or rails, the butt end up, with a strong twine passed round sufficiently tight to cut well through the rind. This secures the plant; then put it round another, in the same way, to the end of the pole, placing them on the opposite side of the pole, *the twine having previously been made*

fast to the pole; thus continue, leaving each plant separate, leaving about 6 inches space between the butts, or, if the poles are small, give more space. The poles or rails should be from 3 to 5 inches through. I hang about 40 plants on a rail of 12 feet in length. If plants are small, more may be hung. If tobacco is crowded on the poles it will pole-sweat the leaf, thicken, and become tender and worthless.

The plants are handed to the person that hangs, and should be shaken to prevent the leaves from sticking to each other.

When through hanging, the building should be opened and allowed a free circulation of air for 2 or 3 weeks, especially if the weather is warm. If cool, less time will answer. To open, and allow a hot sun on the tobacco, would burn it. Open on the other side of the building. When tobacco is ready to strip, the stem of the leaf will be thoroughly dried and hard to the main stalk. This generally occurs about the first of December ; the building is then to be opened on some damp day, and is to be dampened by the atmosphere. The rain should not be allowed to drive on to the tobacco. When sufficiently moist, it will be soft like a kid glove.

It is then carefully taken down by drawing a knife on the pole, and taken to the stripping house, which should be a tight building, and piled, the tips inside, the butts out, and covered with old sail or carpeting, as convenient. Tobacco should not be piled thicker than 12 or 15 inches at this time, *if you have sufficient room,* as the main stalk is very green, and will injure the leaf in a few days.

Tobacco should be stripped in 2 or 3 days at the farthest. If it gets warm, it can be moved. This will

give it air. Later in the season, when the main stalk has become partially cured and changed its color, I have put tobacco in a cellar, and kept it 2 weeks without injury, laying it loosely, without crossing the tips or covering.

The stripping and assorting is done at the same time, making 3 grades. The best leaves are found on the middle of the stalk; the lower leaves of the stalk, with one or two of the smallest top leaves, are the poorest. These are called fillers. Good leaves that are badly torn, light-colored leaves, and sometimes leaves next to the filler from the top, are called binders or 2d grade, and for wrappers none but the best leaves are selected. It will then class—perfect, imperfect, and filler. When making two qualities, as some do, the imperfect and filler are put together.

In stripping and assorting tobacco, there will always be some leaves that are not thoroughly cured, or what we call fat ends ; that is, the stem of the leaf is soft, or swollen, as we call it, near the main stalk ; they are found at the top of the plant, and are to be stripped and laid by for more curing. When cured, they are put into hands, and placed with the fillers. If rather dry for packing, they are to be moistened by the atmosphere. Should any portion of such leaves remain unchanged, they are to be rejected, as they will very essentially injure the tobacco.

When stripped and assorted, it is put into hands and bound at the butts, with a single leaf, containing from 30 to 40 leaves, and secured by passing it through the end. It is then placed in a stack, with the butts out that they may be packed close, to keep the tobacco moist, as when taken from the poles—the stack to be

covered. Care should be taken that the stack does not sweat. If it gets warm, give it air. This will have a tendency to arrest it.

I pack about 375 pounds in a case. The cases are $3\frac{1}{2}$ feet long, $2\frac{1}{2}$ feet wide, $2\frac{1}{2}$ feet deep. When nailed up, put $1\frac{1}{4}$ inch posts in each corner of the boxes, and nail it strong. When packing in boxes or cases, *which must be thoroughly seasoned*, lay the butts of the hands to the ends of the box, straighten out the hands, pack very close, and fill the box to the top ; then place a follower on the top of the tobacco, the size of the box, and press it down by means of a press, made for the purpose, or some other means (*a tobacco press can be made for two or three dollars*). Having pressed this sufficiently, remove the follower, and fill up as before, and continue till the case is full, when it can be nailed, and placed in the barn or other outhouse to be kept dry. It is then ready for the market.

In September or October it will have sweat sufficiently for the manufacturer, if it is packed in good condition. This will require some judgment and experience, as on the sweating will depend in part the value of the tobacco. A good tobacco, imperfectly sweat, will materially lessen its value. If some hands should be too dry at packing, they should be moistened on some damp day; if too moist, they should be allowed to dry. Some hands will be wet, or greasy, as it is called; and they should not be packed in this state.

It is very difficult to raise and cure a crop of tobacco perfectly by receipt. A person about to engage in raising tobacco to any extent, would do well to hire some person that is well acquainted with the raising of the plant and the process of stripping and curing. I know

of no crop that a farmer raises that requires as much practice as this. All growers of tobacco say they learn something every year. Still, any person can raise it with practice.

The quantity of tobacco raised per acre varies like any other crop, from 1000 pounds to 1 ton per acre, and some get more than 1 ton ; 1500 pounds is called an average crop. This depends on land and cultivation. Some claim to have raised 2500 pounds per acre. This I call an extraordinary crop.

The soil best adapted to the growing of tobacco is the upland, as it is called, suitable for wheat or corn, to be manured from 20 to 30 loads per acre, spread over the whole surface, and plowed in. A field that will produce from 40 to 60 bushels of shelled corn per acre, will produce a good crop of tobacco.

Use any manure that you use for corn or other crops.

It is said that land rather moist or wet will not produce a fine quality of tobacco ; even should it produce a large growth, the tobacco will be coarse and burn black, with a disagreeable flavor, and of but little value. Tobacco derives its qualities from the soil and climate.

One acre of tobacco, set 3 feet by $2\frac{1}{2}$ distant, will contain 6,050 plants. This will fill a building 36 by 24 feet, with 12 feet posts, *with the attic*.

Tobacco should not be hung nearer the ground than 18 inches. The space between the rows of poles should be about 4 feet, in order to give a free circulation of air, and the poles should be about 12 inches from each other, according to the size of tobacco, of which the person hanging must use his own judgment.

H. BEARDSLEE.

Trumbull, Ct., *February* 24, 1863.